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CNC CHARLESTON
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INTERIM MEASURES WORK PLAN FOR SOLID WASTE MANAGEMENT UNIT 25 (SWMU
25) WITH TRANSMITTAL CNC CHARLESTON SC
7/7/1999
SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL



H/S

2600 Bull Street
Columbia, SC 29201-1708

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July 7, 1999

Henry Shepard II, P.E.
Caretaker Site Office
NAVFACENGCOM, Southern Division
P. O. Box 190010
North Charleston, SC 29419-9010

Re: Interim Measures Work Plan for SWMU 25, Dated April 9, 1999, Located in
Zone E Charleston Naval Complex SCO 170 022 560, Revision 1.0, Received
June 29, 1999.

Dear Mr. Shepard:

The South Carolina Department of Health and Environmental Control (Department) has reviewed the above referenced Revision 1.0 Interim Measures Work Plan (6/29/99) according to applicable State and Federal Regulations, and the Charleston Naval Complex Hazardous Waste Permit, effective September 17, 1999. Based on this review the referenced Interim Measure Work Plan is approved.

Should you have any questions, please contact me at (803) 896-4185 or Mihir Mehta at (803) 896-4088 or Paul Bergstrand at (803) 896-4016.

Sincerely,

David M. Scaturo, P.E., P.G., Manager
Corrective Action Engineering Section
Bureau of Land & Waste Management

cc: Paul Bergstrand, Hydrogeology
Rick Richter, Trident EQC
David Dodds, SOUTHDIV
Dann Spariosu, EPA Region IV



2600 Bull Street
Columbia, SC 29201-1708

MEMORANDUM

TO: Mihir Mehta, Environmental Engineer Associate
Corrective Action Engineering Section
Hazardous and Infectious Waste Management
Bureau of Land and Waste Management

FROM: Paul M. Bergstrand, P.G., Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Land and Waste Management

DATE: 1 July 1999

RE: Charleston Naval Base (CNAV)
Charleston County, South Carolina
SC0 170 022 560

Interim Measure Workplan
Zone E, SWMU 25
Received 29 June 1999, Revision 1

The materials referenced above have been reviewed with respect to the requirements of R.61-79 of the South Carolina Hazardous Waste Management Regulations, The Environmental Protection Agency's (EPA) RCRA Facility Investigation Guidance Document dated May 1989, the EPA Region IV Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual (SOP/QAM) dated May 1996 and the CNAV Final Comprehensive Sampling and Analysis Plan dated 30 August 1994.

One comment has been provided, however revisions are not necessary.

DD990550.PMB

Zone E, SWMU 25 Work Plan
Paul M. Bergstrand
1 July 1999

1. Page 2, Section 3 WORK PLAN IMPLEMENTATION

The bullet describing the cable conduit excavation has a typographical error stating that removal will occur... “on the north side to the concrete pad.” The text should read “on the west side to the concrete pad.” Revisions are not required.



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July 7, 1999

Henry Shepard II, P.E.
Caretaker Site Office
NAVFACENGCOM, Southern Division
P. O. Box 190010
North Charleston, SC 29419-9010

Re: Interim Measure Work Plan for AOC 643 (PCB and Arsenic Removal), Dated
June 2, 1999, Located in Zone G Charleston Naval Complex SCO 170 022
560.

Dear Mr. Shepard:

The South Carolina Department of Health and Environmental Control (Department) has reviewed the above referenced Interim Measures Work Plan (6/2/99) according to applicable State and Federal Regulations, and the Charleston Naval Complex Hazardous Waste Permit, effective September 17, 1999. Based on this review the referenced Interim Measure Work Plan is approved for PCB and Arsenic Removal at AOC 643.

Should you have any questions, please contact me at (803) 896-4185 or Mihir Mehta at (803) 896-4088 or Paul Bergstrand at (803) 896-4016.

Sincerely,

David M. Scaturo, P.E., P.G., Manager
Corrective Action Engineering Section
Bureau of Land & Waste Management

cc: Paul Bergstrand, Hydrogeology
Rick Richter, Trident EQC
David Dodds, SOUTHDIV
Dann Spariosu, EPA Region IV



2600 Bull Street
Columbia, SC 29201-1708

MEMORANDUM

TO: Mihir Mehta, Environmental Engineer Associate
Corrective Action Engineering Section
Hazardous and Infectious Waste Management
Bureau of Land and Waste Management

FROM: Paul M. Bergstrand, P.G., Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Land and Waste Management

DATE: 1 July 1999

RE: Charleston Naval Base (CNAV)
Charleston County, South Carolina
SC0 170 022 560

Interim Measure Workplan
Zone G, AOC 643
Received 08 June 1999, Revision 0

The materials referenced above have been reviewed with respect to the requirements of R.61-79 of the South Carolina Hazardous Waste Management Regulations, The Environmental Protection Agency's (EPA) RCRA Facility Investigation Guidance Document dated May 1989, the EPA Region IV Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual (SOP/QAM) dated May 1996 and the CNAV Final Comprehensive Sampling and Analysis Plan dated 30 August 1994.

One comment has been provided, however revisions are not necessary.

DD990549.PMB

Zone G, AOC 643 Work Plan

Paul M. Bergstrand

1 July 1999

1. Page 3, Section 5 Sampling

This section states “All sampling phases will be conducted in accordance with the SPORTENVDETHASN RCPM, Section 2H, “Charleston Detachment Health and Safety Plan.” This sampling plan has not been reviewed. However, if the sampling procedures are equal to or exceed the EPA SOP-QAM, revisions are not required.



2600 Bull Street
Columbia, SC 29201-1708

BUREAU OF LAND AND WASTE MANAGEMENT
DIVISION OF HAZARDOUS AND INFECTIOUS WASTE MANAGEMENT

July 12, 1999

Mr. Henry Shepard II, P.E.
Caretaker Site Office
NAVFACENGCOM, Southern Division
P.O. Box 190010
North Charleston, SC 29419-9010

RE: Charleston Naval Complex (CNC) Site Wide Strategy for the development, submittal, review, and approval of Corrective Measures Study (CMS) Work Plans and Reports

Dear Mr. Shepard:

The Charleston Naval Complex is one of the facilities identified by the EPA as having a high priority for cleanup under the RCRA cleanup reforms (see letter dated June 8, 1999 from David Scaturro to William Drawdy). Goals have been set by the EPA under the Government Performance and Results Act (GPRA) which target 95 percent of the high priority facilities to have "current human exposures under control" and 70 percent of the high priority facilities to have "migration of contaminated groundwater under control" by the year 2005. In order to help achieve these stated goals, the South Carolina Department of Health and Environmental Control (Department) recommends that the Navy-CNC develop a generic strategy to accomplish the following:

- Identify the individual or groupings of SWMUs and AOCs within or across zones that would comprise a CMS work plan or report.
- Prioritize the review and approval of the CMS work plans and reports.
- Identify a generic outline for the development and approval of CMS work plans and reports.

The Department believes that the referenced strategy will facilitate and streamline the development, review, and approval of CMS work plans and reports for the Charleston Naval Complex, and also expedite the Corrective Measures Implementation (CMI) process for more complex sites.

Mr. Henry Shepard II
July 12, 1999
page 2 of 2

Because of the complexity of the CNC, and the inter-relationships between similar SWMUs and AOCs located within different zones, the Department recommends that the Navy-CNC focus its attention on the completion and approval of the zone-specific RFI reports with respect to the implementation of the overall CMS/CMI strategy. It is often more efficient to focus investigation and data collection on information relevant to support the implementation of appropriate remedial actions rather than to fulfill separate evaluations at each step in the process. According to Departmental records, Zones E, F, G, I, J, K, and L have RFI reports pending revisions, review, and/or approval. The Department recognizes the urgency to proceed with the CMS process, and therefore, intends to assist the Navy-CNC by expediting the review and approval process for the RFI reports.

The Department will defer the review of the Draft CMS Reports submitted for Zone H (SWMU 159 and AOC 653) and Zone A (SWMU 2 and SWMU 38) until the above referenced strategy is developed and agreed upon by all parties, and the RFI process is completed.

Thank you for your assistance and cooperation in this matter. Should you have any questions regarding this letter, or would like additional information, please do not hesitate to contact me at (803) 896-4185, or Mihir Mehta at (803) 896-4088, or Paul Bergstrand at (803) 896-4016.

Sincerely,



David Scaturo, P.E., P.G.
Manager, Corrective Action Engineering Section

cc: Mihir Mehta, Corrective Action Engineering
Ann Clark, EQC Administration
Melissa King, Corrective Action Engineering
Paul Bergstrand, P.G., Hydrogeology
Rick Richter, Trident EQC District
David Dodds, SOUTHDIIV
Dann Spariosu, Ph.D., EPA Region IV



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July 12, 1999

Henry Shepard II, P.E.
Caretaker Site Office
NAVFACENGCOM, Southern Division
P. O. Box 190010
North Charleston, SC 29419-9010

Re: Interim Measures Work Plan for AOC 684 (Outdoor Pistol Range); dated June 25, 1999; Located in Zone H Charleston Naval Complex SCO 170 022 560.

Dear Mr. Shepard:

The South Carolina Department of Health and Environmental Control (Department) has reviewed the above referenced Interim Measures Work Plan (6/25/99) according to applicable State and Federal Regulations, and the Charleston Naval Complex Hazardous Waste Permit, effective September 17, 1999. The attached comments were generated based on this review. These comments must be addressed prior to the final approval of the referenced document and field implementation of the interim measure.

Further, the Department is available to clarify any of the attached comments before the submittal of the comment responses and the revised pages in order to expedite the resolution of these issues.

Should you have any questions, please contact me at Mihir Mehta at (803) 896-4088 or Paul Bergstrand at (803) 896-4016.

Attachment: Memorandum from Paul Bergstrand to Mihir Mehta dated July 8, 1999.

Sincerely,

Mihir P. Mehta, Project Manager
Corrective Action Engineering Section
Bureau of Land & Waste Management

cc: Paul Bergstrand, Hydrogeology
Rick Richter, Trident EQC
David Dodds, SOUTHDIV
Dann Spariosu, EPA Region IV

South Carolina Department of Health and Environmental Control comments on: Interim Measures Work Plan for AOC 684 (Outdoor Pistol Range); dated June 25, 1999; Located in Zone H Charleston Naval Complex SCO 170 022 560.

Comments Generated By Mihir Mehta:

1. 1.0 Background; page 1.
Please provide the maximum and average lead concentrations detected at this AOC.
2. Section 3.3; Phase III Confirmation Sampling; page 2.
This paragraph does not describe whether the confirmatory samples collected be composited into one sample or discrete analysis will be performed. The confirmatory sampling and analysis should be discrete to understand the nature and extent of residual contaminant concentration at these two sites.

Also, explain how or what criteria were used for the selection of confirmatory samples (both location and number).


Please revise this section to address this concern.
3. Figure 1; AOC 684 Confirmatory Sample Location.
The referenced figure does not provide any perspective as to what are the dimensions/area for proposed excavation. Please provide another figure with scale to show the excavation area and sample locations to confirm the horizontal extent of excavation.



2600 Bull Street
Columbia, SC 29201-1708

MEMORANDUM

TO: Mihir Mehta, Environmental Engineer Associate
Corrective Action Engineering Section
Hazardous and Infectious Waste Management
Bureau of Land and Waste Management

FROM: Paul M. Bergstrand, P.G., Hydrogeologist 
Hazardous Waste Section
Division of Hydrogeology
Bureau of Land and Waste Management

DATE: 8 July 1999

RE: Charleston Naval Base (CNAV)
Charleston County, South Carolina
SC0 170 022 560

Interim Measure Workplan
Zone H, AOC 684
Dated 2 July 1999, Received 6 July 1999, Revision 0

The materials referenced above have been reviewed with respect to the requirements of R.61-79 of the South Carolina Hazardous Waste Management Regulations, The Environmental Protection Agency's (EPA) RCRA Facility Investigation Guidance Document dated May 1989, the EPA Region IV Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual (SOP/QAM) dated May 1996 and the CNAV Final Comprehensive Sampling and Analysis Plan dated 30 August 1994.

One comment has been provided. Revisions are not necessary. This work plan is approvable.

DD990560.PMB

Zone H, AOC 684 IM Work Plan

Paul M. Bergstrand

8 July 1999

1. Appendix B, Site Specific Health and Safety Plan

Review of this section is deferred.



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July 12, 1999

Henry Shepard II, P.E.
Caretaker Site Office
NAVFACENGCOM, Southern Division
P. O. Box 190010
North Charleston, SC 29419-9010

Re: Interim Measures Work Plan for Other Impacted Areas (OIAs) Grid G07 and Grid G038; dated June 29, 1999; Located in Zone H Charleston Naval Complex SCO 170 022 560.

Dear Mr. Shepard:

The South Carolina Department of Health and Environmental Control (Department) has reviewed the above referenced Interim Measures Work Plan (6/29/99) according to applicable State and Federal Regulations, and the Charleston Naval Complex Hazardous Waste Permit, effective September 17, 1999. The attached comments were generated based on this review. These comments must be addressed prior to the final approval of the referenced document and field implementation of the interim measure.

Further, the Department is available to clarify any of the attached comments before the submittal of the comment responses and the revised pages in order to expedite the resolution of these issues.

Should you have any questions, please contact me at Mihir Mehta at (803) 896-4088 or Paul Bergstrand at (803) 896-4016.

Attachment: Memorandum from Paul Bergstrand to Mihir Mehta dated July 8, 1999.

Sincerely,

Mihir P. Mehta, Project Manager
Corrective Action Engineering Section
Bureau of Land & Waste Management

cc: Paul Bergstrand, Hydrogeology
Rick Richter, Trident EQC
David Dodds, SOUTHDIV
Dann Spariosu, EPA Region IV

South Carolina Department of Health and Environmental Control comments on: Interim Measures Work Plan for Other Impacted Areas (OIAs) Grid G07 and Grid G038; dated June 29, 1999; Located in Zone H Charleston Naval Complex SCO 170 022 560.

Comments Generated By Mihir Mehta:

1. Section 4; Work Plan Implementation; page 2.
Third line states, "The excavation depth for both locations is approximately 1 foot."

Section 2; Work Plan Objective; page 1.
This section states that the cleanup level for PCB contaminated soil will be < 1 ppm (parts per million)-which is the clean definition.

The two goals stated above are contradicting as 1 foot of soil excavation may not reduce the PCB contaminated soils to levels below 1 ppm. Therefore, only one interim measure objective or goal should be stated in the referenced document (i.e., the PCB contaminated soils will be removed to meet the clean definition of less than 1 ppm as specified by 40 CFR 761.125). Please revise the document to address this concern.
2. Section 5; Sampling; page 2.
This paragraph does not describe whether the confirmatory samples collected be composited into one sample or discrete analysis will be performed. The confirmatory sampling and analysis should be discrete to understand the nature and extent of residual contaminant concentration at these two sites.

Also, explain how or what criteria were used for the selection of confirmatory samples (both location and number).

Please revise this section to address this concern.
3. Appendix A; 1. Site History; page A-1.
Please provide brief description and figure to orient the sites (G07 & G038) within Zone H and with respect to SWMU or AOC within which the RFI sampling was conducted.
4. Figure 3 and 4; PCB Excavation Area for Grid07 and G038.
Section 4, page 2, fourth line states that, "Samples collected to delineate the site horizontally will be used to confirm the horizontal extent of excavation." The referenced figure does not show any sample locations to confirm the horizontal extent of excavation. Please revise these figures to address this concern. Please show the excavation area for G038 on Figure 4.



2600 Bull Street
Columbia, SC 29201-1708

MEMORANDUM

TO: Mihir Mehta, Environmental Engineer Associate
Corrective Action Engineering Section
Hazardous and Infectious Waste Management
Bureau of Land and Waste Management

FROM: Paul M. Bergstrand, P.G., Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Land and Waste Management

DATE: 8 July 1999

RE: Charleston Naval Base (CNAV)
Charleston County, South Carolina
SC0 170 022 560

Interim Measure Workplan
Zone H, OIAs G07 and G038
Received 1 July 1999, Revision 0

The materials referenced above have been reviewed with respect to the requirements of R.61-79 of the South Carolina Hazardous Waste Management Regulations, The Environmental Protection Agency's (EPA) RCRA Facility Investigation Guidance Document dated May 1989, the EPA Region IV Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual (SOP/QAM) dated May 1996 and the CNAV Final Comprehensive Sampling and Analysis Plan dated 30 August 1994.

Two comments have been provided.

DD990559.PMB

Zone H, OIAs G07 and G038 Work Plan

Paul M. Bergstrand

8 July 1999

1. Page 2, Section 4 WORK PLAN IMPLEMENTATION

This section states “The extent of the excavation...at location G07 shown in Figure 3 of Appendix D.... (and)... at location G038 shown in Figure 4 of Appendix D...” The extent of excavation is not clearly indicated on either figure. Please revise these two figures.

The two revised figures may be submitted to be included in the workplan. The two revised figures should be submitted before the document can be approved.

2. Appendix B, Site Specific Health and Safety Plan

Review of this section is deferred.



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July 16, 1999

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Southern Division
Naval Facilities Engineering Command
Caretaker Site Office
P.O. Box 190010
North Charleston, S.C. 29419-9010
Attn.: William Drawdy

Dear Mr. Drawdy:

We are in receipt of your letter, serial number CSO/86, and submittal of analytical results representing some nine tons of non-hazardous well-drilling cuttings, identified as Number 99SPORT 0208-1. The analytical data, as performed by General Engineering Laboratories, represent selected **total metals**, **total petroleum hydrocarbons** and **extractable organic halides**.

The data, as submitted, demonstrate that the selected **total metals** and the **extractable organic halides** are well within acceptable regulatory limits. The **total petroleum hydrocarbons** do, however, exceed current policy guidance levels.

Your proposal to submit these to Southeastern Soils Recovery for thermal treatment is acceptable to the department.

This approval covers only these well cuttings as represented by the accompanying analytical data, as submitted by your office. Any further disposal requests must be made on a case by case basis. If I may be of further assistance, please contact me immediately at 803-896-4120. Thank you.

Sincerely,

Stephen Burdick, Manager
Waste Assessment Section
Bureau of Land and Waste Management

CC: F. M Carns, BLWM
Mihir Mehta, BLWM

CSO FILE COPY



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July 21, 1999

Henry Shepard II, P.E.
Caretaker Site Office
NAVFACENGCOM, Southern Division
P. O. Box 190010
North Charleston, SC 29419-9010

Re: Memorandum/Report for the AOC 621 Soil Sampling, located in Zone E
NAVBASE Charleston, dated June 30, 1999.

Dear Mr. Shepard:

The South Carolina Department of Health and Environmental Control (Department) has reviewed the above referenced memorandum (6/30/1999) according to applicable State and Federal Regulations, and the Charleston Naval Complex Hazardous Waste Permit, effective September 17, 1998. The attached comments were generated based on this review. These comments must be addressed prior to the final approval of the referenced document.

Further, the CNC should submit the revised memorandum as a part of Zone E RFI Report currently under revision. The CNC should submit, to the Department, the comment responses to address these comments within thirty (30) calendar days of the receipt of this letter. This would facilitate the comment resolution meeting and help to incorporate the information in the revised Zone E RFI report for review and approval.

Should you have any questions regarding these comments, please contact me at (803) 896-4088 or Paul Bergstrand at (803) 896-4016.

Sincerely,

m.p. mehta

Mihir P. Mehta, Project Manager
Corrective Action Engineering Section
Bureau of Land & Waste Management

Attachments:

1. Memorandum from Charles B. Watson to Mihir Mehta dated July 19, 1999.
2. Memorandum from Eric Cathcart to Mihir Mehta dated July 15, 1999.

cc: Rick Richter, Trident EQC
David Dodds, SOUTHDIIV
Dann Spariosu, EPA Region IV
Paul Bergstrand, Hydrogeology
Eric Cathcart, Hydrogeology
Charles B. Watson, Corrective Action Engineering



2600 Bull Street
Columbia, SC 29201-1708

RECEIVED

JUL 15 1999

SC DHEC - Bureau of
Land & Waste Management

MEMORANDUM

To: **M. [REDACTED] Data**, Environmental Engineer Associate
Corrective Action Engineering Section
Hazardous and Infectious Waste Management
Bureau of Land and Waste Management

From: Eric F. Cathcart, GIT, Hydro geologist *EC*
Hazardous Waste Section
Division of Hydrogeology
Bureau of Land and Waste Management

Date: 15 July 1999

RE: Charleston Naval Base (CNAV)
Charleston, South Carolina
SC0 170 022 560

Comments

Soil Sampling Plan, Zone E, AOC 621
[Dated 30 June 1999, Revision 0]

The South Carolina Department of Health and Environmental Control (the Department) has received and reviewed the above referenced document. Comments generated by the Department have been attached for your review and may be incorporated with your comments to the facility. Based on the results of this review the AOC 621 Soil Sampling Report is approvable provided the following conditions are addressed and incorporated into the Final Report.

If you require additional information, please contact me at 896-4045.

cc: Paul Bergstrand, Hydrogeology
Charles Watson, Permitting

DD990574.EFC

AOC 621 Soil Sampling Report
15 July 1999

1. The report should be revised to indicate the proposed depth of soil samples and a brief description of how the samples will be collected (ie., hand auger or hollow stem auger). Also, if an individual sample reveals a detection above the agreed action level for lead, how will the Navy determine the vertical extent of the contaminant?
2. The four soil samples collected for this investigation revealed several contaminants, other than lead, above their industrial RBCs. This evidence is in direct conflict with the statement on page one of the report, "Other constituents were also detected but do not appear to be a concern under an industrial setting". The Department agrees with focusing on lead as the target compound for the removal action; however, the Navy should continue to delineate other compounds to assist in the RFI process. With this in mind, the Navy should analyze soil samples from this investigation for the full Appendix IX list of constituents. All analytical information gained from these borings should be included in the RFI for this area of concern.

MEMORANDUM

To: ~~REDACTED~~, Environmental Engineer Associate
Corrective Action Engineering Section
Hazardous and Infectious Waste Management
Bureau of Land and Waste Management

From: Charles B. Watson
Corrective Action Engineering Section
Division of Hazardous & Infectious Waste Mgt.
Bureau of Land and Waste Management

Date: July 19, 1999

RE: Charleston Naval Base (CNAV)
Charleston, South Carolina
SC0 170 022 560

Comments

Memorandum dated June 30, 1999
Zone E, AOC 621 Soil Sampling

The above referenced document completed by Ensafe Inc. has been reviewed.

If you require additional information, please contact me at 896-4212.

General Comments

1. AOC 621 is located within AOC 605. According to the Zone E RFI, AOC 605 is described as a 40 x 250 concrete pad. Therefore, soil sampling for AOC 621 will require coring of the concrete pad. The sampling plan does not discuss this issue.

2. The plan does not address soil sampling depths. Please revise the sampling plan to specify sampling depths. A discussion of the depth of contamination in the area of previous soil

removal should be made in reference to proposed sampling depths in the new area.

3. There are other contaminants that exceed their industrial RBC's other than lead. These should be included in the analysis of future soil samples.



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July 21, 1999

Henry Shepard II, P.E.
Caretaker Site Office
NAVFACENGCOM, Southern Division
P. O. Box 190010
North Charleston, SC 29419-9010

Re: Technical Memorandum Proposing NFA Status for SWMU 136/AOC 663
Located in Zone H of the Charleston Naval Complex, SCO 170 022 560,
dated June 18, 1999.

Dear Mr. Shepard:

The South Carolina Department of Health and Environmental Control (Department) has reviewed the above referenced technical memorandum (6/18/99) according to applicable State and Federal Regulations, and the Charleston Naval Complex Hazardous Waste Permit, effective September 17, 1999. The attached comments were generated based on this review. These comments must be addressed prior to the final approval of the referenced document.

Further, the CNC should submit, to the Department, the comment responses to address these comments within thirty (30) calendar days of the receipt of this letter. This would facilitate the comment resolution meeting and expedite the review and approval process for the referenced document.

Should you have any questions regarding these comments, please contact me at (803) 896-4088 or Paul Bergstrand at (803) 896-4016.

Sincerely,

m. p. mehta.

Mihir P. Mehta, Project Manager
Corrective Action Engineering Section
Bureau of Land & Waste Management

Attachments: Memorandum from Paul Bergstrand to Mihir dated July 21, 1999.

cc: Paul Bergstrand, Hydrogeology
Rick Richter, Trident EQC
David Dodds, SOUTHDIV
Dann Spariosu, EPA Region IV

South Carolina Department of Health and Environmental Control comments on: Technical Memorandum Proposing NFA Status for SWMU 136/AOC 663 Located in Zone H of the Charleston Naval Complex, SCO 170 022 560, dated June 18, 1999.

Comments by Mihir Mehta.

1. Figure 1; SWMU 136 & AOC 663 Site Map.
The referenced figure does not delineate the boundary of SWMU 136 or AOC 663. It is very hard to locate the sample locations whether they are in SWMU 136 or AOC 663. Please show the site boundary with respect to the buildings written in the text and sample locations.

Please indicate the groundwater flow directions and its variations for this area.

Please show clearly, by some form of shading, the paved area and the grassy areas as indicated by the legend.
2. The referenced technical memorandum proposes NFA for the two sites SWMU 136 and AOC 663. For the State to agree or disagree with this proposal, CNC-Navy should provide basic figures delineating the current contamination in soils and groundwater with respect to the remediation goal of $1E-6$ for soils under default residential scenario and MCLs or Tap water RBCs for groundwater and/or background. Also, soil to groundwater leachability analysis using site specific information should be conducted. The referenced technical memorandum fails to provide these evaluations. Please revise the document to address this concern.
3. Navy DET Activities; page 3.
Please show the locations for the piping and USTs that were removed by Navy DET with respect to AOC 663.
4. Please provide adequate information as to what depths constitute surface and subsurface samples for the soils. Also, include this information on Table 1 page 5 of this memorandum.
5. Table 2; Groundwater Data; page 6.
The referenced table providing groundwater data has sample numbers and date to reference each sample. The figure shows the groundwater sample locations or well locations. There is no information provided to understand the connection or relation between sample numbers and sample locations and therefore cannot interpret the groundwater data. Please provide adequate information to understand and interpret the groundwater data.



2600 Bull Street
Columbia, SC 29201-1708

MEMORANDUM

TO: Mihir Mehta, Environmental Engineer Associate
Corrective Action Engineering Section
Hazardous and Infectious Waste Management
Bureau of Land and Waste Management

FROM: Paul M. Bergstrand, P.G., Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Land and Waste Management

DATE: 21 July 1999

RE: Charleston Naval Base (CNAV)
Charleston County, South Carolina
SC0 170 022 560

Technical Memorandum
Zone H, SWMU 136/ AOC 663
Dated 18 June 1999, Revision 0

The materials referenced above have been reviewed with respect to the requirements of R.61-79 of the South Carolina Hazardous Waste Management Regulations, The Environmental Protection Agency's (EPA) RCRA Facility Investigation Guidance Document dated May 1989, the EPA Region IV Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual (SOP/QAM) dated May 1996 and the CNAV Final Comprehensive Sampling and Analysis Plan dated 30 August 1994.

Some notes and comments have been provided. These items should be addressed before re-submitting this Technical Memorandum.

Technical Memorandum
Zone H, SWMU 136/AOC 663
Paul M. Bergstrand
21 July 1999

1. Page 1, Site Description

The first sentence states "SWMU 136 is a former Satellite Accumulation Area (SAA) that received hazardous waste from NS 851 and nearby NS 53." That sentence is the extent SWMU 136 is addressed in this as well as the CMS. The RFA provides a description of the SAA as being inside Building NS 51. The SAA has not been represented on any maps submitted to date and because of this it is impossible to determine if the sample locations are adequate and representative. The SAA must be defined and represented on the site map before a decision can be made.

2. Page 1, Site Description

The last sentence states "There were no Navy DET ISMs completed at this site,..." However, Page 3, Navy DET Activities describes how the Navy DET removed the USTs and associated piping in June of 1996. Please correct.

3. Page 2, Figure 1

The direction of groundwater flow was not indicated in this Technical Memorandum. A review of the CMS Work Plan indicated groundwater flow was to the north west which means the two SWMU 178 wells are not downgradient to the AOC 663 wells. A downgradient well for AOC 663 may be necessary.

4. Page 3, Site Background

The last sentence begins by stating, "Pending the results of these additional investigations,..." A review of Department files reveals that the results of the supplemental investigations, including laboratory reports and chain of custody forms, have not been submitted. These results should be presented in final form before a determination can be made.

5. Page 3, Navy DET Activities

This section describes the fourth piping run soil sample from AOC 663 as being “...below the detection limit for all the BTEX and PAH constituents that were analyzed, with the exception of....” This is a contradictory style of reporting analytical results (nothing was detected.... except for) and should not be repeated by the Navy.

6. Page 4, Navy DET Activities

The last sentence states “....all of the excavated soil was returned to the tank pit.” This contradicts the November 1997 CMS Work Plan which makes a strong point that “The area (AOC 663) from which this sample was collected has since been excavated by the Navy DET during a UST removal.” This CMS Work Plan later repeats the statement and implies the site risk and hazard are likely less than stated in the text because of the soil excavation and removal. Please provide some definitive documentation regarding the disposition of excavated soils.

7. Page 4, CMS Groundwater Sampling

The second paragraph describes historical analytical data for DEHP (a.k.a. BEHP) in field blanks and laboratory blanks. There was no mention of historical analytical data for trip blanks or materials blanks. This data should be included in the discussion. In addition, it is not clear if the field blanks in this submittal are actually field blanks, field equipment rinse blanks or trip blanks (per EPA definition). The types of blanks must be clarified.

8. Page 4, CMS Groundwater Sampling

This section states “A total of 45 field blank samples were analyzed for the presence of BEHP.” If this statement is correct, only 45 field blanks have been collected and analyzed for SVOCs since the RFI process has begun at this facility. Please verify the number of blank samples collected from Zone H sampling and analyzed for SVOCs.

The sample identification letter codes are not explained in the text. Please revise.

9. Page 4, CMS Groundwater Sampling

The second paragraph discussion of historical analytical data for field blanks concludes with the following statement “The highest BEHP level in a single non-detect sample was 130 ug/l.” It is not clear if the elevated detection level is a result of matrix interference or some other unexplained factor. Please revise.

10. DEHP was reported in surface soil samples 663SB002, 663SB004 and 663SB005 in the RFI Report. The levels of DEHP increased in 66% of the subsurface soil samples. These soil samples are upgradient of monitoring well 663GW002 which reported DEHP in 3 of 5 groundwater samples. All soil and groundwater analytical data should be re-evaluated for SWMU 663.

The location of soil borings 663SB005 and 663SB007 have been reversed from Figure 5.4.3 in the Final CMS Work Plan dated April 1998. Please confirm the correct location.

11. Page 10, Recommendation

The text states “BEHP is a common additive in many types of plastics including well materials and well sampling supplies.” The memorandum failed to include other uses of DEHP, which include organic pump fluids, solvent for inks, and pesticides. While the most common use today is in plastics, the prior use of DEHP by the Navy in pump fluids, solvents, pesticides or other unknown applications cannot be dismissed. Please revise.

12. Page 10, Recommendation

The section concludes “If there are remaining regulatory issues associated with the Navy DET tank removal performed at the site, these should be handled by the appropriate UST/PST program.” When the comments related to AOC 663 are resolved, this site may be transferred to the SC UST program for final disposition.

13. The following table was generated in an attempt to understand if there was a link between sample data and blank results for DEHP. NR = data not reported in this document. The typical use of blank sample analysis is to provide quality control for a discrete sampling event. The Based upon the data submitted, the Navy has not proven a link between positive blank and positive sample results for DEHP. In addition, SWMU 178 should be re-evaluated.

SAMPLE ID	DEHP Results	Date	Field Blank SWMU ID	Field Blank Results DEHP	Date	Lab Blank Results DEHP	Date
178GW001-01	11U	10-19-94	17EW001-01	14.1	10-18-94	NR	NR
178GW001-02	1300U	4-26-95	9EW08D-02	26	4-25-95	NR	NR
178HW001-02	530J	4-26-95	9FW08D-02	8.4J	4-25-95	NR	NR
178GW001-03	290	9-21-95	667DW001-03	4.2J	9-23-95	NR	NR
178GW001-04	27U	3-26-96	NR	NR	NR	6J	3-28-96
178GW001-05	14U	5-28-98	NR	NR	NR	2J	5-29-98
178GWC01-01	13	3-18-99	NR	NR	NR	NR	NR
663GW002-01	NR	NR	NR	NR	NR	NR	NR
663GW002-02	25U	3-30-95	GDHFW07D-02	11U	3-31-95	NR	NR
663GW002-03	180	9-13-95	9DW007-03	22	9-15-95	NR	NR
663GW002-04	59	3-14-96	NR	NR	NR	2J	3-18-96
663GW002-05	11U	5-28-98	NR	NR	NR	2J	5-29-98
663GWC02-01	0.6J	3-18-99	NR	NR	NR	NR	NR



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July 22, 1999

Henry Shepard II, P.E.
Caretaker Site Office
NAVFACENGCOM, Southern Division
P. O. Box 190010
North Charleston, SC 29419-9010

Re: Memorandum Proposing Aquifer Testing and Free Product Recovery
Evaluation for SWMU 17; Located in Zone H of the Charleston Naval
Complex, SCO 170 022 560, dated July 6, 1999.

Dear Mr. Shepard:

The South Carolina Department of Health and Environmental Control (Department) has reviewed the above referenced memorandum (7/6/99) according to applicable State and Federal Regulations, and the Charleston Naval Complex Hazardous Waste Permit, effective September 17, 1999. The attached comments were generated based on this review. These comments must be addressed prior to the final approval of the referenced document.

Further, the CNC should submit, to the Department, the comment responses to address these comments within thirty (30) calendar days of the receipt of this letter. This would facilitate the comment resolution meeting and expedite the review and approval process for the corrective action documents.

Should you have any questions regarding these comments, please contact me at (803) 896-4088 or Paul Bergstrand at (803) 896-4016.

Sincerely,

m. p. mehta
Mihir P. Mehta, Project Manager
Corrective Action Engineering Section
Bureau of Land & Waste Management

Attachments: Memo. from Paul Bergstrand to Mihir Mehta dated July 16, 1999.

cc: Paul Bergstrand, Hydrogeology
Rick Richter, Trident EQC
David Dodds, SOUTHDIV
Dann Spariosu, EPA Region IV

South Carolina Department of Health and Environmental Control comments on: Memorandum Proposing Aquifer Testing and Free Product Recovery Evaluation for SWMU 17; Located in Zone H of the Charleston Naval Complex, SCO 170 022 560, dated July 6, 1999.

Comments by Mihir Mehta:

1. The Department believes that CNC-Navy should have scoped the referenced proposal, prior to submittal, in-order to get the input from the "CNC-Team". The Department also believes that the e-mail attachment is not the appropriate way for submitting proposals that require extensive regulatory review and approval. Please address this concern
2. Based on the review of the referenced proposal the Department believes that the information provided is not sufficient and the goals and objectives stated are not consistent with the proposed field activities. The first page lists the objectives to be achieved by conducting the proposed testing. First three objectives; 1) delineate contamination over the site and under the building, 2) delineate the extent of free product material in the subsurface, 3) estimate the volume of free product material in the subsurface, are all related to an incomplete RCRA Facility Investigation (RFI). Further, in the document it states that the source of the free product contamination is unknown, which is also an incomplete RFI issue. The last three objectives relates to the testing of the rate and effectiveness of free product and feasibility of subsequent dissolved-phase groundwater remediation, which are issues related to CMS.

As written, it is confusing and unclear as to what administrative approach is proposed for accomplishing the proposed work. Based on the objectives stated in the proposal, the Department recommends to the CNC-Navy to present the referenced proposal in context with CMS Addendum in order to complete the RFI, Interim Measure Work Plan to reduce source and control plume growth, and the CMS Work Plan Supplemental-Treatability Study for evaluating proposed technology. Please scope and revise the proposed strategy to address the stated concerns.

3. The referenced proposal fails to provide estimated time frame for conducting various field activities to accomplish the stated goals. Please revise.
4. The referenced proposal does not provide any figures, maps, and cross-sections that illustrates the hydrogeologic conditions at the SWMU, current contamination both in soils & groundwater, the proposed field activities with respect to current conditions, and how are the proposed goals targeted. Please revise the referenced document accordingly.



2600 Bull Street
Columbia, SC 29201-1708

MEMORANDUM

TO: Mihir Mehta, Environmental Engineer Associate
Corrective Action Engineering Section
Hazardous and Infectious Waste Management
Bureau of Land and Waste Management

FROM: Paul M. Bergstrand, P.G., Hydrogeologist *PMB*
Hazardous Waste Section
Division of Hydrogeology
Bureau of Land and Waste Management

DATE: 16 July 1999

RE: Charleston Naval Base (CNAV)
Charleston County, South Carolina
SC0 170 022 560

Draft Aquifer Testing and Free Product Recovery Evaluation
Zone H, SWMU 17
Dated 6 July 1999, Revision 0

The materials referenced above have been reviewed with respect to the requirements of R.61-79 of the South Carolina Hazardous Waste Management Regulations, The Environmental Protection Agency's (EPA) RCRA Facility Investigation Guidance Document dated May 1989, the EPA Region IV Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual (SOP/QAM) dated May 1996 and the CNAV Final Comprehensive Sampling and Analysis Plan dated 30 August 1994.

Some notes and comments have been provided. These items should be addressed before approving this plan.

Zone H, Draft Aquifer Testing and Free Product Recovery Evaluation
Zone H, SWMU 17
Paul M. Bergstrand
16 July 1999

1. This memorandum references two figures which were not included in the e-mail. Please include the figures.

Please note, maps and figures submitted for this workplan must accurately represent all pertinent site information such as the building cooling tower, AST 600, oil pipelines, the oil water separator (OWS), OWS feed and drain lines .

Please include a figure representing the horizontal extent of the groundwater contamination and averaged groundwater flow directions.

2. Section 2.0

This section describes monitoring and extraction wells. Please provide a scaled sketch of the monitoring and recovery wells showing:

- A ground surface, the water table, the lithology as well as the marsh clay.
- B the dimensions of the well borings, the filter pack, the well casing highlighting the screened, unscreened and end plug of the wells.
- C the NAPLs and dissolved phase contaminants.
- D any other important details.

Please include a description of how the location of the recovery well was selected.

3. Section 2.2

This section states that “approximately 100 feet east of well 017001 recent results indicate the consistent presence of NAPL material.” Please elaborate and document this evidence.

The presence of NAPL west of 017001 indicates the need of additional sampling to determine the full extent of NAPL and dissolved contamination which may require additional samples within the building and additional recovery wells.

4. Section 2.3

This section proposed to convert the two interior soil borings into monitoring wells if free phase material is detected. In light of the types of contaminant, the semi-defined extent and the potential dewatering effects, it is strongly recommended that the plans be modified to install the monitoring wells regardless of the presence of NAPL during the soil boring. Please modify the plans to reflect this.

Figure 2-23 in the 8-5-1992 RFI Work Plan (copy enclosed) indicates the inside sump is contaminated with 78 ppm PCBs. The interior soil borings must manage all IDW as hazardous waste until proven by confirmation samples.

5. Section 2.4

This section states that preliminary calculations predict an overall radius of influence of 82 feet after one week of pumping. The work plan does not discuss a sampling schedule to verify the preliminary calculations. Please include a sampling schedule.

6. Section 2.5

This section of the work plan states "Sampling and analysis of the discharged groundwater will be performed in accordance with pretreatment requirements." The analysis program should include VOCs, SVOCs, PAHs and PCBs. Please include a list of sample analysis.

7. Section 5.1

This section of the plan states "The most recent analytical results from monitoring well 017001 are in compliance with (North Charleston Sewer System) standards." Please indicate if those standards include analysis for PCBs. Also, please include the date of the most recent analysis and where those results may be found.

8. Figure 2-23 in the 8-5-1992 RFI WP indicates several fuel tanks due east of the southwest sump. The status or fate of those tanks has not been addressed in any of the recent documents. The tanks may contribute to NAPL. Please update the status of the tanks.

9. A recent site visit noted the presence of an OWS at SWMU 17. OWSs commonly received waste solvents as well as oils and grease. It is possible the PCBs at this SWMU were released from the OWS. To date, the source of the PCBs has not been identified. The OWS does not appear to have been addressed during the RFI Report. Please address the following issues;

- A The status of the OWS.
- B When the OWS was last cleaned.
- C When the OWS was inspected for cracks, gaps, spills or overfills.
- D The results of the OWS inspection.
- D What drains which lead into and out of the OWS.
- E What is the status of the OWS drainage system.
- F The results of any dye testing and when the dye testing was conducted .

Additional work and/or sampling at this OWS may be required.

10. A recent site visit noted dead and stressed vegetation at the rear of building 1815. It appears the vegetation was killed by something leaking between the building walls and the slab foundation. This should be investigated immediately, independent of the work proposed for SWMU 17.

TABLE 2-12
SAMPLING POINTS AND PCB CONCENTRATIONS
AT FBM-61
OIL SPILL AREA

SAMPLE POINT	PCB CONCENTRATION (ppm)
#65 Tank 25B	<10
#66 NS 600	<10
#67 19B	T 118 B <1
#68 Unknown tank (NSC700)	T 306 B <1
#69 TV north side (soil)	139
#70 Dirt pile southside from digging	1
#71 Drummed dirt from south side digging	6
#72 5800 gal tank car	<1
#73 NSC 700	T 476 B <1
#74 North sump	T 639 B <1
#75 Southeast sump	T <1 B <1
#76 South center sump	T <1 B <1
#77 Southwest sump	T <1 B <1
#78 19B	T 146 B <1
#79 25B	T <1 B <1
#80 NS 600	<1
#81 Drum #1	<1
#82 Drum #2	<1
#83 Drum #3	<1
#84 Drum #4	<1
#85 Drum #5	<1
#86 Drum #6	<1
#87 Drum #7	<1
#88 Drum #8	<1
#89 Drum #9	<1
#90 Drum #10	<1
#91 Drum #11	<1
#92 Drum #12	<1

TABLE 2-12 SAMPLING POINTS AND PCB CONCENTRATIONS AT FBM-61 OIL SPILL AREA	
SAMPLE POINT	PCB CONCENTRATION (ppm)
#93 Drum #13	<1
#94 Drum #14	<1
#95 Drum #15	<1
#96 Chase inside FBM-61	78

Table taken from Reference 2

T = Top layer
B = Bottom layer

SAMPLING POINTS AT FBM-61

Soil

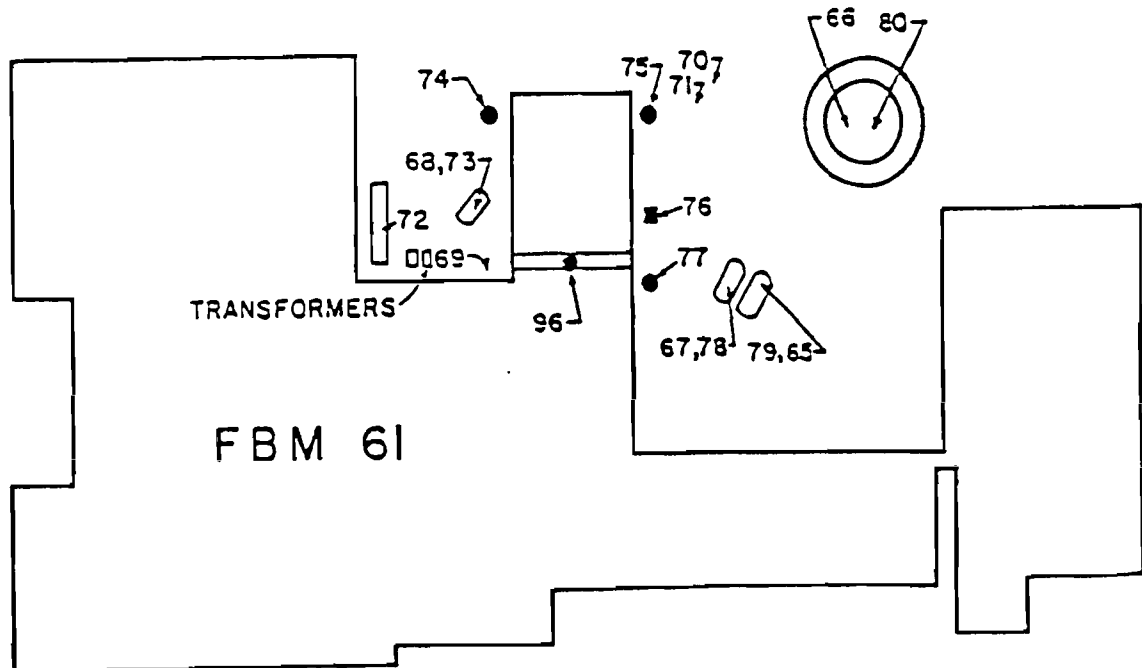
- #69 TV Northside
- #70 Dirt Pile Southside
from digging
- #71 Drummed dirt from
Southside digging

Oil Recovered From River

#81 - 95

Oil Sampling Point

- 65 - Tank 25B
- 66 - NS 600
- 67 - 19B
- 68 - Unknown (NSC 700)
- 72 - 5800 gal tank car
- 73 - NSC 700
- 74 - North sump
- 75 - Southeast sump
- 76 - South center sump
- 77 - Southwest sump
- 78 - 19B
- 79 - 25B
- 80 - NS 600
- 96 - Inside sump



RFI WORKPLAN
CHARLESTON NAVAL
SHIPYARD
CHARLESTON, S.C.

FIGURE 2-23
SLMU #17
OIL SPILL AREA
(FIGURE TAKEN FROM REF. 2)

DATE 08/05/92

DWG NAME: CNSY



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July 26, 1999

Henry Shepard II, P.E.
Caretaker Site Office
NAVFACENGCOM, Southern Division
P. O. Box 190010
North Charleston, SC 29419-9010

Re: Zone F (AOC 709) RCRA Facility Investigation (RFI) Report Addendum,
Charleston Naval Complex, SCO 170 022 560, dated March 31, 1999.

Dear Mr. Shepard:

The South Carolina Department of Health and Environmental Control (Department) has reviewed the above referenced RFI Report Addendum (3/3/199) according to applicable State and Federal Regulations, and the Charleston Naval Complex Hazardous Waste Permit, effective September 17, 1999. The attached comments were generated based on this review. These comments must be addressed prior to the approval of the above referenced document.

Further, the CNC should submit, to the Department, the comment responses to address these comments within thirty (30) calendar days of the receipt of this letter. This would facilitate the comment resolution meeting and expedite the review and approval process. CNC should submit the Revised Zone F RFI Report in its entirety after the attached comments have been addressed.

Should you have any questions regarding this comments, please contact me at (803) 896-4088 or Paul Bergstrand at (803) 896-4016.

Sincerely,

Mihir P. Mehta, Project Manager
Corrective Action Engineering Section
Bureau of Land & Waste Management

cc: Paul Bergstrand, Hydrogeology
Rick Richter, Trident EQC
Paul Bristol, Underground Storage Tank
David Dodds, SOUTHDIV
Dann Spariosu, EPA Region IV

Henry
Billy
Joel
File

HNS 7/29
[Signature]

South Carolina Department of Health and Environmental Control comments on: Zone F (AOC 709) RCRA Facility Investigation (RFI) Report Addendum, Charleston Naval Complex, SCO 170 022 560, dated March 31, 1999.

Comments By Mihir Mehta:

1. Section 10.10.2; Field Investigation Approach; page 10.10.5.
It appears that the investigation for this RFI addendum focused on the soils and groundwater and did not include the “source” (i.e., the fuel distribution pipeline). Is the fuel distribution pipeline still operating, if not was it pressure flushed upon ceasing the operation, or was the inside of the pipeline investigated to see whether there is any fuel source left in place? Please revise this section or propose additional investigation strategy to address this concern.
2. Section 10.10.3; Soil Sampling and Analysis; page 10.10.5.
This section describes the one CPT soil sample collected as a part of “soil investigation” for the AOC 709 (Fuel Distribution Pipeline System). According to the Figure 10.10.1 the length of AOC 709 is approximately 720 feet. The Department believes that one soil sample is not adequate to fully delineate the nature and extent of contamination. The Figure should show the details about the joints in the pipeline, manholes, and other key features that are of interest for soil sample locations (e.g., sample depth with respect to pipeline). Please propose adequate sampling strategy for all media for this AOC and/or provide adequate justification and rationale for not collecting additional samples.
3. Section 10.10.3.1; Nature of Contamination in Subsurface Soil; page 10.10.5.
It appears that the nature of contamination at this AOC is delineated based on SSLs and not background concentrations. The Department does not agree with this approach. The nature and extent of contamination in any media should be delineated based on background concentrations. The SSLs or RBCs are numbers to understand or put into perspective the severity of the problem or risk associated with the site. Please revise all pertinent sections of the referenced document to address this concern.
4. Table 10.10.2; page 10.10.8.
The table shows the organic compound analytical results for subsurface soils that are calculated based on generic SSLs using a DAF of 20. The fact that groundwater is very shallow in this area and CNC have enough site-specific information to develop site specific SSLs, the Department expects CNC to develop site specific SSLs using “simple site-specific SSL” approach as described in the EPA SSL Guidance. Please revise the document to address this concern.

5. Section 10.10.4.1; Inorganic Elements in Groundwater; page 10.10.26.
This section discusses that the arsenic concentration in shallow groundwater is consistently greater than zone specific background and MCL, but fails to identify and characterize the source of arsenic contamination. Please provide additional information for the arsenic source or propose additional characterization to address this concern.

6. Figure 10.10-4; Arsenic in Shallow groundwater.
The well location FDS16B indicates arsenic detection of 236 ug/L whereas the text on page 10.10.26 states that the maximum arsenic detection is 160 ug/L. Please explain this discrepancy between the figure and text.

From the figure there are only three wells based on which the isoconcentration line is drawn to show arsenic concentrations greater than 16.7 ug/L. The arsenic detections in these three wells are 109, 236, and 42.3 ul/L. The full extent of arsenic contamination is not defined and is hard to understand how the marked area on the map defines the arsenic contamination above background when none of these wells have arsenic concentrations below background.

Also, no cross-sections have been provided to illustrate the vertical extent of arsenic contamination. Please revise all pertinent sections of the referenced document to address these concerns.

7. 10.10.5.2; Groundwater Migration and Surface Water Cross-Media Transport; page 10.10.29.

This paragraphs states that “the risk-based pathway for shallow groundwater is currently an invalid pathway simply because there is no human consumption of the groundwater, e.g., there is no end-use receptor.” All groundwater in the State of South Carolina is considered as potable water regardless of the land use. Also, the Department evaluates the risk posed by groundwater for future land use. Based on the stated facts, the Department does not agree with statement and recommends CNC to delete any and all language related to this issue or rewrite consistent with Departments expectations.

8. 10.10.5.2; Groundwater Migration and Surface Water Cross-Media Transport; page 10.10.31.

The last paragraphs discusses the mercury detection in groundwater and states that the trend and source is not defined. There is no information provided as to what are the concentration levels and there are no figures delineating the nature and extent of mercury contamination. Adequate information to understand the nature and extent of mercury contamination is not provided, therefore revise the document to address this concern.

9. 10.10.5.2; Groundwater Migration and Surface Water Cross-Media

Transport; page 10.10.29.

This section concludes that the current groundwater contamination will not impact the surface water bodies but fails to provide any analysis or modeling used to reach this conclusion. Please revise the document, as necessary, to understand and substantiate the stated conclusions.

10. Section 10.10.6; Human Health Risk Assessment; page 10.10.33.

This section does not evaluate the risk associated with the soils and the source (fuel distribution pipeline). As stated in previous comments the nature and extent of soil contamination is not defined and therefore, it is pre-mature not to consider the human health risk assessment for soils and source. Please revise as necessary.

11. Section 10.10.6.5; COCs Identified; page 10.10.45.

The fourth sentence states that, "For carcinogens, this approach is relatively conservative, because a cumulative risk level of $1E-4$ is recommended by EPA Region IV as the trigger for establishing COCs." This is not a correct interpretation of EPA's approach to the COC selection process. Media based COCs are selected based on carcinogenic risk equal to or greater than $1E-6$ and non-carcinogenic hazard equal to or greater than HI of 1. EPA has defined an acceptable risk range of $1E-4$ - $1E-6$ for risk managers to make risk management decisions (i.e., whether active action or passive action or institutional controls or no remedial action may be appropriate) for various land uses. Risk assessment is a tool to understand the sensitivity and magnitude of the problem therefore, please delete or revise the text to address this concern.



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July 29, 1999

Henry Shepard II, P.E.
Caretaker Site Office
NAVFACENGCOM, Southern Division
P. O. Box 190010
North Charleston, SC 29419-9010

Re: Interim Measures Work Plan for Other Impacted Areas (OIAs) Grid G07 and Grid G038; dated June 29, 1999; Located in Zone H Charleston Naval Complex SCO 170 022 560. Comment Responses and revised pages for the Interim Measures Work Plan received July 23, 1999.

Dear Mr. Shepard:

The South Carolina Department of Health and Environmental Control (Department) has reviewed the above referenced Interim Measures Work Plan (6/29/99) according to applicable State and Federal Regulations, and the Charleston Naval Complex Hazardous Waste Permit, effective September 17, 1999. Based on this review the referenced interim measures work plan is approved as submitted.

Should you have any questions, please contact me at (803) 896-4185 or Mihir Mehta at (803) 896-4088 or Paul Bergstrand at (803) 896-4016.

Sincerely,

David M. Scaturo, P.E., P.G., Manager
Corrective Action Engineering Section
Bureau of Land & Waste Management

Attachment: Memorandum from Paul Bergstrand to Mihir Mehta dated July 28, 1999.

cc: Paul Bergstrand, Hydrogeology
Rick Richter, Trident EQC
David Dodds, SOUTHDIV
Dann Spariosu, EPA Region IV

HENRY ANS 8/3/99
BILLY WES
JOHN _____
FILE _____



2600 Bull Street
Columbia, SC 29201-1708

MEMORANDUM

TO: Mihir Mehta, Environmental Engineer Associate
Corrective Action Engineering Section
Hazardous and Infectious Waste Management
Bureau of Land and Waste Management

FROM: Paul M. Bergstrand, P.G., Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Land and Waste Management

DATE: 28 July 1999

RE: Charleston Naval Base (CNAV)
Charleston County, South Carolina
SC0 170 022 560

Interim Measure Workplan
Zone H, OIAs G07 and G038
Received 23 July 1999, Revision 1

The materials referenced above have been reviewed with respect to the requirements of R.61-79 of the South Carolina Hazardous Waste Management Regulations, The Environmental Protection Agency's (EPA) RCRA Facility Investigation Guidance Document dated May 1989, the EPA Region IV Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual (SOP/QAM) dated May 1996 and the CNAV Final Comprehensive Sampling and Analysis Plan dated 30 August 1994.

This Workplan is approvable.



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Columbia, SC 29201-1708

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July 29, 1999

Henry Shepard II, P.E.
Caretaker Site Office
NAVFACENGCOM, Southern Division
P. O. Box 190010
North Charleston, SC 29419-9010

Re: Interim Measures Work Plan for AOC 684 (Outdoor Pistol Range); dated June 25, 1999; Located in Zone H Charleston Naval Complex SCO 170 022 560. Comment responses and revised pages received on July 23, 1999.

Dear Mr. Shepard:

The South Carolina Department of Health and Environmental Control (Department) has reviewed the above referenced Interim Measures Work Plan (6/25/99) according to applicable State and Federal Regulations, and the Charleston Naval Complex Hazardous Waste Permit, effective September 17, 1999. Based on this review the referenced interim measures work plan is approved.

Should you have any questions, please contact me at (803) 896-4185 or Mihir Mehta at (803) 896-4088 or Paul Bergstrand at (803) 896-4016.

Sincerely,

David M. Scaturo, P.E., P.G., Manager
Corrective Action Engineering Section
Bureau of Land & Waste Management

cc: Paul Bergstrand, Hydrogeology
Rick Richter, Trident EQC
David Dodds, SOUTHDIV
Dann Spariosu, EPA Region IV

HENRY
BILLY
JOHN
TILE

HWS 8/3/99
WCS
—
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DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

P.O. BOX 100010

2155 EAGLE DRIVE

NORTH CHARLESTON, S.C. 29419-9010

5090/11

Code 18710

30-Jul-99

Mr. John Litton, P.E.
Director, Division of Hazardous and Infectious Waste Management
Bureau of Land and Waste Management
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, SC 29201

Subj: SUBMITTAL OF THE AOC 681 ADDENDUM TO THE ZONE I RCRA FACILITY
INVESTIGATION REPORT

Dear Mr. Litton:

The purpose of this letter is to submit the enclosed AOC 681 Addendum to the Zone I RFI Report in the form of page changes for Naval Base Charleston. The document is submitted to complete the document allowing review and fulfill the requirements of condition IV.E.2 of the RCRA Part B permit issued to the Navy by the South Carolina Department of Health and Environmental Control and the U.S. Environmental Protection Agency (USEPA).

The Navy requests that the Department and the USEPA review the entire revised RFI report for Zone I and provide comment or approval whichever is appropriate. If you should have any questions please contact Billy Drawdy or Tony Hunt at (843) 743-9985 and (843) 820-5525 respectively.

Sincerely,

DAVID P. DODDS
Remedial Project Manager
Environmental Department

Encl:

(1) AOC 681 Addendum to the Zone I RFI Report, EnSafe, dated 30 July 1999

Copy to:

SCDHEC (Paul Bergstrand, Mihir Mehta), USEPA (Dann Spariosu)

CSO Naval Base Charleston (Billy Drawdy), SOUTHNAVFACENGCOM (Tony Hunt)



2600 Bull Street
Columbia, SC 29201-1708

COMMISSIONER:
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Rodney L. Grandy

August 2, 1999

Henry Shepard II, P.E.
Caretaker Site Office
NAVFACENGCOM, Southern Division
P. O. Box 190010
North Charleston, SC 29419-9010

Re: Interim Measure Work Plan for AOC 633 (PCB Contaminated Soil Removal),
Located in Zone G Charleston Naval Complex, Dated June 22, 1999.

Dear Mr. Shepard:

The South Carolina Department of Health and Environmental Control (Department) has reviewed the above referenced Interim Measures Work Plan (6/22/99) according to applicable State and Federal Regulations, and the Charleston Naval Complex Hazardous Waste Permit, effective September 17, 1999. The attached comments were generated based on this review. These comments must be addressed prior to the field implementation of the above referenced interim measures. Further, the Department is available to clarify any of the attached comments before the submittal of the comment responses and the revised document in order to expedite the resolution of these issues.

Should you have any questions regarding this comments, please contact me at (803) 896-4088 or Paul Bergstrand at (803) 896-4016.

Sincerely,

M. P. Mehta

Mihir P. Mehta, Project Manager
Corrective Action Engineering Section
Bureau of Land & Waste Management

Attachments: Memorandum from Susan Peterson to Mihir Mehta dated 7/29/99.
Memorandum from Michael Danielson to Mihir Mehta dated 7/14/9.

cc: Rick Richter, Trident EQC
David Dodds, SOUTHDIV
Dann Spariosu, EPA Region IV
Susan Peterson, Corrective Action Engineering
Michael Danielson, Hydrogeology
Paul Bergstrand, Hydrogeology

Henry
Billy
John
FILE

HWS 3/E
WBS



Review of *Interim Measure Work Plan for AOC 633*, received June 28, 1999

Comments prepared by Susan Peterson on July 29, 1999

1. Section 1.0, Introduction

Please state the dates of operation. The text states that Building 451C was built in 1943.

2. Section 1.0, Introduction

The text states that "several high voltage switches, breakers and transformers were formerly located in the structure." Please revise or expand the text to clarify the operations that occurred in Building 451C. If the items were stored, please note how and where they were stored (inside and/or outside of Building 451C). If the items were damaged, please state this. Please approximate the location of the "several large PCB releases."

3. Section 1.0, Introduction

Please include a reference to Zone G's RFI report to support the sentence "The environmental concern is PCBs as Aroclor 1260."

4. Section 2.0, Work Plan Objective

No samples were collected from inside Building 451C. If the CNC is unable to verify that the operations did not occur in the building, the Department would require samples to be collected from the soil under the concrete floor in Building 451C in order to understand the area of excavation under the proposed IM.

5. Figures

Please provide a figure that shows AOC 633 (including boundaries) and related features to orient this AOC to Zone G.

6. Section 4.2.1, general requirements

The text states that "Samples taken to delineate the location for PCB will be evaluated for confirmation of PCB removal to the levels specified in paragraph 2 of this IM." Please revise this statement to clarify that samples will be collected following the excavation of the PCB-contaminated subsurface soils (to confirm that PCB has been removed and that the levels of PCB remaining in the soil are at <1 ppm). A figure, noting the number and location of the confirmation samples should be included in the work plan, as should a statement regarding the type of analyses to be performed on the confirmation samples.

7. Section 4.2.1, general requirements

The statement "groundwater encountered will be sampled for documentation prior to disposal" raises questions. Please explain what "sampled for documentation" means. Please clarify which constituents the groundwater will be analyzed for?

Disposal of groundwater is dependent on the analytical results. Groundwater sampled should be drummed until analytical results are known.

8. Appendix B, #3

Please note what will occur upon encountering groundwater.

9. Appendix B

The Department defers the review of the Site Specific Health and Safety Plan



2600 Bull Street
Columbia, SC 29201-1708

RECEIVED
JUL 22 1999

SC DHEC - Bureau of
Land & Waste Management

MEMORANDUM

TO: Mihir Mehta, Environmental Engineer Associate
Corrective Action Engineering Section
Hazardous and Infectious Waste Management
Bureau of Land and Waste Management

FROM: Michael W. Daniels, Hydrogeologist *MWD*
Hazardous Waste Section
Division of Hydrogeology
Bureau of Land and Waste Management

DATE: July 14, 1999

RE: Charleston Naval Base (CNAV)
Charleston County, South Carolina
SC0 170 022 560

Interim Measure Workplan
Zone G, AOC 633
Received 1 July 1999, Revision 0

The materials referenced above have been reviewed with respect to the requirements of R.61-79 of the South Carolina Hazardous Waste Management Regulations, The Environmental Protection Agency's (EPA) RCRA Facility Investigation Guidance Document dated May 1989, the EPA Region IV Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual (SOP/QAM) dated May 1996 and the CNAV Final Comprehensive Sampling and Analysis Plan dated 30 August 1994.

The comments are attached.

Zone G, AOC 633 Work Plan

Michael W. Danielsen

July 14, 1999

1. **Page 2, Section 4.1 a PHASE I: REROUTE ELECTRICAL SERVICE and PRE-EXCAVATION WORK**

The last sentence states that horizontal delineation will be done by sampling. What type of sampling method will be used to collect the soil samples and what is the expected depth of the sampling method? Please revise the text as needed and illustrate the proposed sampling locations on a site specific diagram to confirm adequate spacing.

2. **Page 3, Section 4.2.1, d, GENERAL REQUIREMENTS**

This sentence states that groundwater will be sampled if encountered. What type of sampling method will be used to collect the water sample? Please revise to include this information in the text.

The excavation should continue if groundwater is encountered until all contaminated soil has been removed from the site.

The workplan stated that the groundwater would be sampled before disposal. It is not unusual to find metals associated with PCB sites. Will the groundwater be sampled for PCB compounds as well as metals? Please expand sampling analysis to include RCRA IX metals and revise the text as needed. During transformer use, dielectric properties may leach metals from transformer components into the PCB fluid.

Is there a contingency plan if groundwater is found to be contaminated? Will the process continue, then groundwater be addressed or will excavation be stopped to address the groundwater? Please clarify and revise the text as needed.

3. **Page 3, Section 4.3.1 GENERAL REQUIREMENTS**

This section states that confirmatory samples will be taken. How many samples are expected to be taken from the excavation? Please revise the text to include the information as needed.

4. **Appendix A, Page A-2, Figure 10.2-2**

The figure depicts a marked area around 633SB001. Is this the expected area to be excavated? If so what is planned for the marked area around 633SB007 on figure 10.2-3, page A-3 also has PCB contamination > 1ppm? The text does not mention that an excavation will be done around 633SB001. Please revise the text to include proposed excavations as well as number of confirmatory samples.

What is the expected area of excavation around 633SB001? Please revise the document with a site specific diagram showing the expected excavation as well as confirmatory sampling locations as needed.

5. **Appendix B**

Review of this section is deferred.

6. **Appendix D, Page D-1, Figure 1 AOC 633 Delineation Confirmation Samples**

The figure shows four horizontal confirmation sampling locations and no vertical confirmation sampling location. Where will the vertical samples be located? Please revise this information in the text and on this figure.

7. **General Comments**

The horizontal, vertical, and any groundwater confirmatory samples taken from areas around SB001 and SB007 should be presented as discreet samples in the report after field work is completed.



2600 Bull Street
Columbia, SC 29201-1708
18 August 1999

CERTIFIED MAIL

Mr. H.N. Shepard II, P.E.
Caretakers Site Office
1690 Turnbull Avenue, Building NH-51
Charleston Naval Base
Charleston, SC 29405

RE: Naval Base Charleston (CNAV)
Charleston, South Carolina
SC0-170-022-560

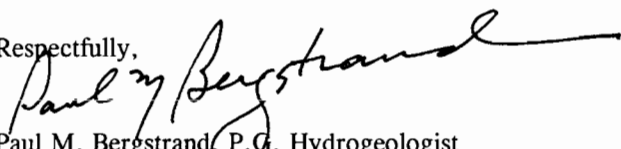
Additional Monitoring Well Request for Zone A, SWMU 39
Revision 1, Dated 17 August 1999

Dear Mr. Shepard:

The above referenced request has been reviewed with respect to R.61-79.265 Subpart F of the South Carolina Hazardous Waste Management Regulations and R.61-71 of the South Carolina Well Standards and Regulations. This request is for the installation of one additional temporary monitoring well as part of well approval HW-99-053 dated 30 June 1999 to assess contamination and parameters of the surficial aquifer. The monitoring wells are anticipated to be completed to a maximum depth of approximately fifty feet. The additional well is approved.

Please note, the associated sampling protocol for this site has not been reviewed or approved. Attached, please find a copy of the proposed well locations. A copy of the monitor well approval form and this letter should be on site during drilling operations. The temporary well abandonment procedures must follow R.61-71.10 (b5) of the South Carolina Well Standards and Regulations. Additional assessment may be required at these well locations. Should there be any questions, please contact me at (803) 896-4016.

Respectfully,


Paul M. Bergstrand, P.G. Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Land and Waste Management

Enclosures
PMB/pmb
HW-99-053

CC: Christine Sanford-Coker, Trident District EQC
Paul Bristol, BOW
Mihir Mehta, Hazardous Waste Permitting Section
Tony Hunt, Southern Division, Charleston
Todd Haverkost, EnSafe, Mount Pleasant, SC 29464

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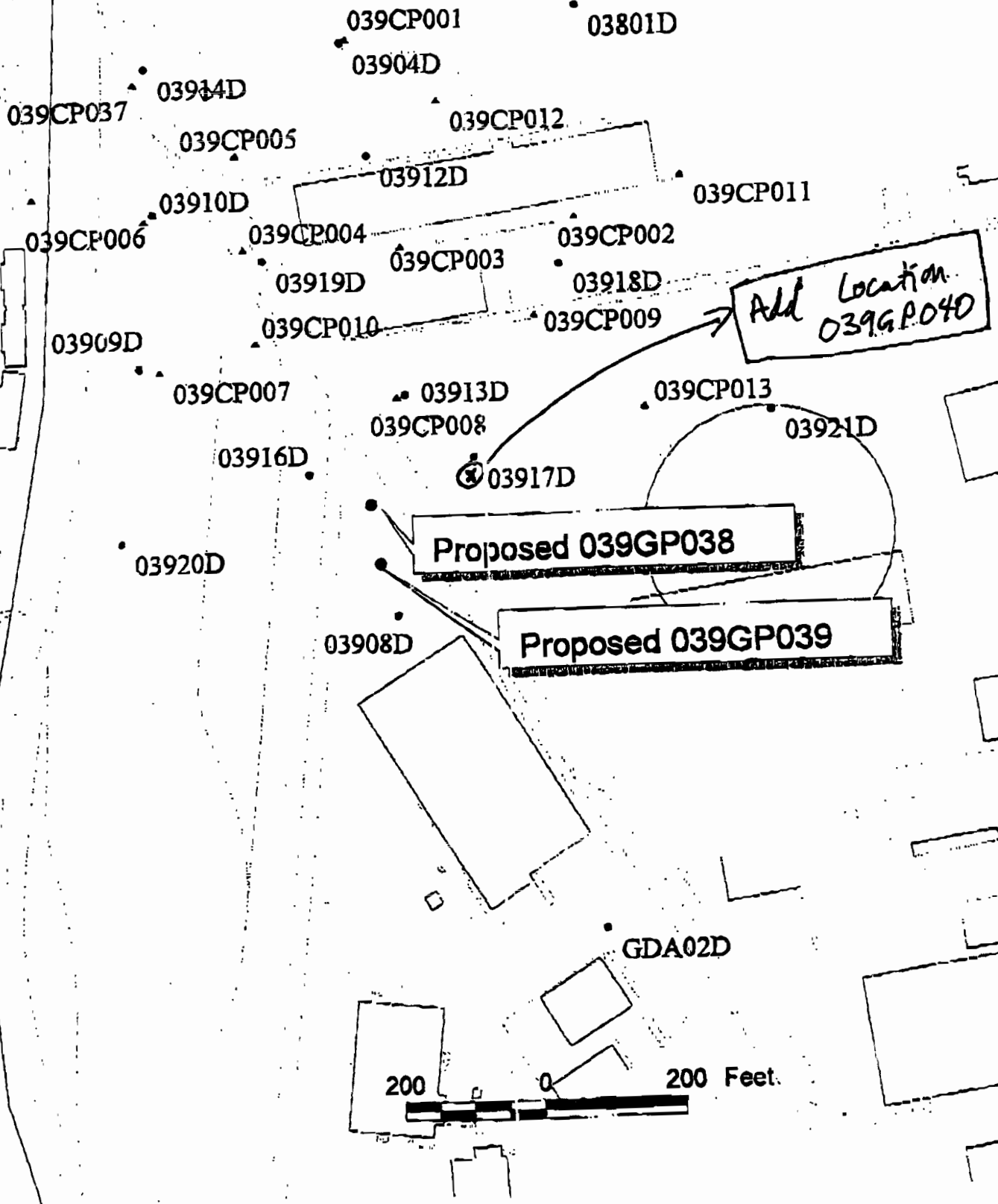
AUG-17-1999 10:01

EN SAFE, INC.

803 856 0107107 P.02/02

SWMU 39, ZONE A [CNC]

N





2600 Bull Street
Columbia, SC 29201-1708

27 August 1999

Billy ~~WAS~~
Henry ~~HNS~~ 9/8/99
File _____

CERTIFIED MAIL

Mr. H.N. Shepard II, P.E.
Caretakers Site Office
1690 Turnbull Avenue, Building NH-51
Charleston Naval Base
Charleston, SC 29405

RE: Naval Base Charleston (CNAV)
Charleston, South Carolina
SC0-170-022-560

Temporary Monitoring Well Request for Zone A, SWMU 39
Revision 0, Dated 24 August 1999

Dear Mr. Shepard:

The above referenced request has been reviewed with respect to R.61-79.265 Subpart F of the South Carolina Hazardous Waste Management Regulations and R.61-71 of the South Carolina Well Standards and Regulations. This request is for the installation of two temporary monitoring wells to assess parameters of the surficial aquifer. The monitoring wells are anticipated to be completed to a maximum depth of approximately fifteen feet.

Please note, the actual well locations have yet to be determined but will be near well clusters 39009 or 39020. Attached, please find a copy of the proposed well locations. A copy of the monitor well approval form and this letter should be on site during drilling operations. The temporary well abandonment procedures must follow R.61-71.10 (b5) of the South Carolina Well Standards and Regulations. Additional assessment may be required at these well locations. Should there be any questions, please contact me at (803) 896-4016.

Respectfully,

Paul M. Bergstrand, P.G. Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Land and Waste Management

Enclosures
PMB/pmb
HW-99-075

CC: Christine Sanford-Coker, Trident District EQC
Paul Bristol, BOW
Mihir Mehta, Hazardous Waste Permitting Section
Tony Hunt, Southern Division, Charleston
Todd Haverkost, EnSafe, Mount Pleasant, SC 29464

Fig. 1 Proposed temporary piezometer locations

03919D



039009

039P26 039P27

03909I

03909D

002006

039016

03916I

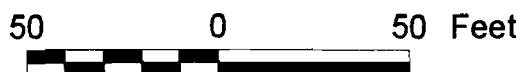
03916D

039020

039P26 039P27

03920I

03920D





2600 Bull Street
Columbia, SC 29201-1708

27 August 1999

Henry ~~HKS~~ 9/8
Billy ~~W~~
File —

CERTIFIED MAIL

Mr. H.N. Shepard II, P.E.
Caretakers Site Office
1690 Turnbull Avenue, Building NH-51
Charleston Naval Base
Charleston, SC 29405

RE: Naval Base Charleston (CNAV)
Charleston, South Carolina
SC0-170-022-560

Temporary Monitoring Well Request for Zone K, SWMUs 163 and 166
Revision 0, Dated 17 August 1999

Strategy for Vertical Profiling
Revision 0, Dated 27 August 1999

Dear Mr. Shepard:

The above referenced request has been reviewed with respect to R.61-79.265 Subpart F of the South Carolina Hazardous Waste Management Regulations and R.61-71 of the South Carolina Well Standards and Regulations. This request is for the installation of 23 temporary DPT monitoring wells to assess contamination and parameters of the surficial aquifer. The monitoring wells are anticipated to be completed to a maximum depth of approximately fifty feet. Due to the investigation trying to determine the full extent of contamination, this approval is written to include an additional 20 DPT well points to be installed if needed. The locations of the additional DPT points will be determined from the data collected and using the Strategy for Vertical Profiling. Please keep this office and Christine Sanford-Coker informed of the DPT data. Please coordinate the additional DPT locations with Christine Sanford-Coker as well as this office.

Attached, please find a copy of the proposed well locations and the Strategy for Vertical Profiling. A copy of the monitor well approval form and this letter should be on site during

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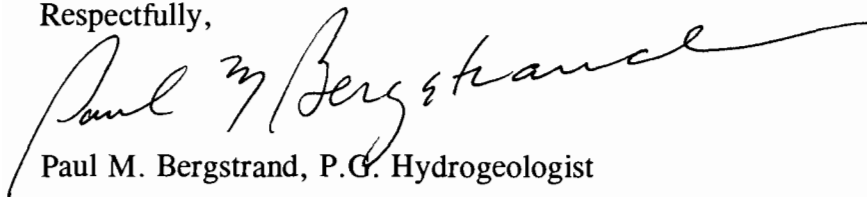
Mr. H.N. Shepard II, P.E.

27 August 1999

Page 2

drilling operations. The temporary well abandonment procedures must follow R.61-71.10 (b5) of the South Carolina Well Standards and Regulations. Additional assessment may be required at these well locations. Should there be any questions, please contact me at (803) 896-4016.

Respectfully,

A handwritten signature in cursive script, reading "Paul M. Bergstrand". The signature is written in black ink and is positioned above the printed name.

Paul M. Bergstrand, P.G. Hydrogeologist

Hazardous Waste Section

Division of Hydrogeology

Bureau of Land and Waste Management

Enclosures

PMB/pmb

HW-99-053

CC: Christine Sanford-Coker, Trident District EQC

Paul Bristol, BOW

Mihir Mehta, Hazardous Waste Permitting Section

Tony Hunt, Southern Division, Charleston

Todd Haverkost, EnSafe, Mount Pleasant, SC 29464



2600 Bull Street
Columbia, SC 29201-1708

Temporary Monitoring Well Installation Approval

Approval is hereby granted to: Mr. Shepard of Naval Base Charleston for

Zone K, SWMUs 163 and 166
Naval Base Charleston
Charleston County

for the construction of monitoring wells designated in accordance with the construction plans and specifications submitted to the Department on 20 August 1999 (Kafka to Bergstrand). The wells will be constructed within the surficial aquifer to a maximum depth of approximate fifty feet below the surface and screened for the purpose of monitoring aquifer conditions.

Conditions:

1. A driller certified to operate in the State of South Carolina must install the wells.
2. That the latitude and longitude, surveyed elevations, boring and/or geologist logs, and actual construction details for each direct push well point be submitted to the Department within 30 days after installation of the last well point.
3. All well construction and sampling derived wastes, including but not limited to, drill cuttings and fluids, development and purge water, must be managed properly and in accordance with all applicable state and federal requirements. If containerized, each vessel shall be clearly labeled with regard to contents, source, and date of activity.
4. That requirements R.61-71.11.C(1-7) for completing these borings as permanent monitoring wells are waived.
5. That all sampling points will be abandoned as outlined in R.61-71.10.
6. DPT field equipment, including sampling probes, must be decontaminated by steam cleaning before use and between sampling locations. Well screens and casing must be decontaminated before installation.
7. That notice be given to Christine Sanford-Coker, Charleston District EQC Hydrogeologist, during normal business hours at (803) 740-1590 a minimum of 48 hours before the initiation of drilling activities.

This approval is pursuant to the provisions of Section 44-55-40 of the 1976 South Carolina Code of Laws and the Department of Health and Environmental Control Well Standards and Regulations, R.61-71.

Date of Issue: 27 August 1999

Approval Number: HW-99-074

Paul M. Bergstrand, P.G. Hydrologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Land and Waste Management

DD990674.TMW



Fig. 1
General Site Map for Vertical Profiling Using DPT
Zone K - CNC

100 0 100 200 Feet



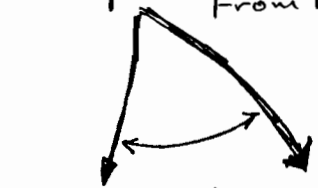
FIG. 2 NAVAL ANNEX GROUNDWATER ELEVATIONS (msl), 16 AUG 99

100 0 100 Feet



Handwritten note: Range of GW Flow From RFI

Range of GW Flow From RFI



PMB - 27 Aug 99

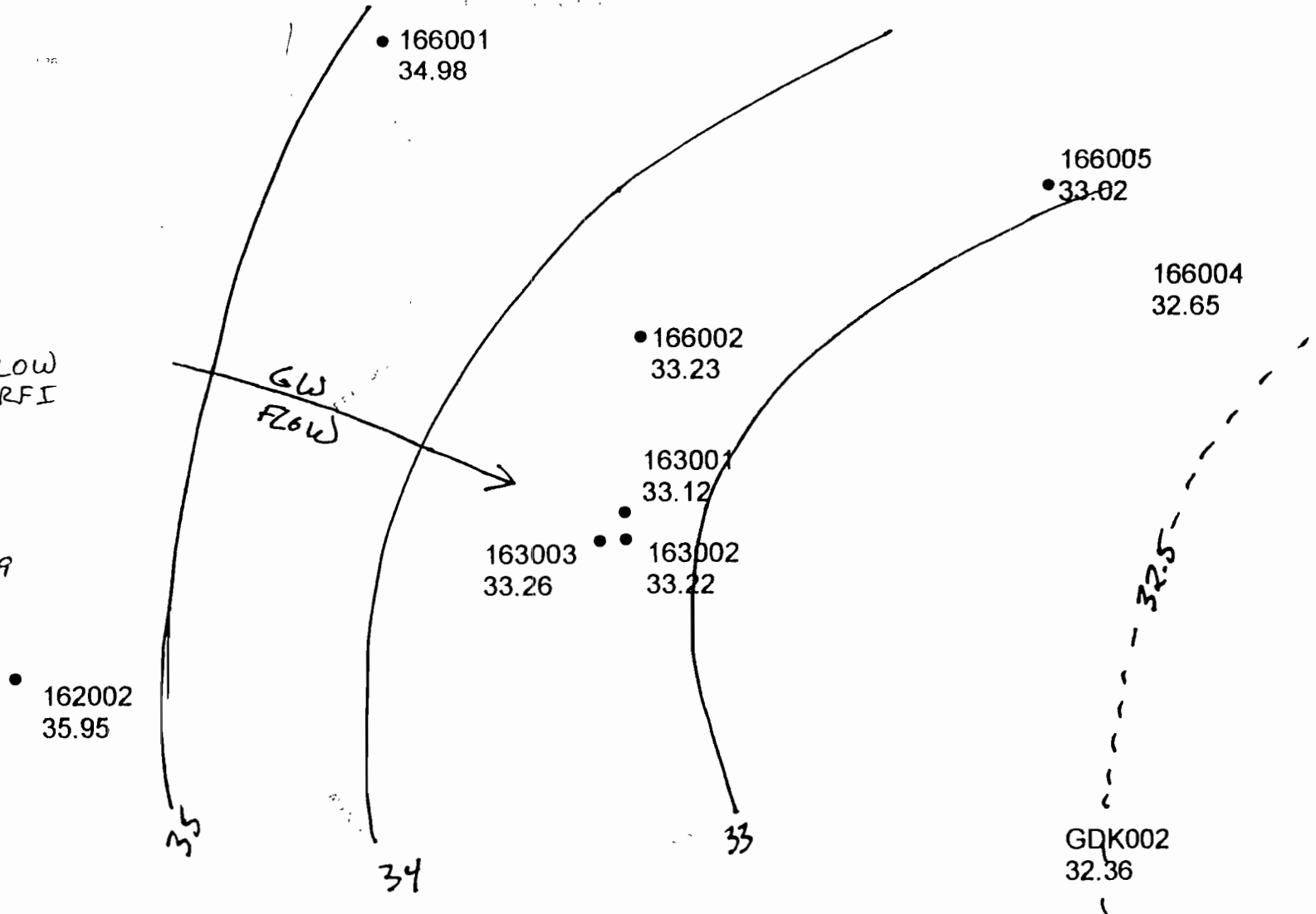


Figure 3 - SWMU 163 DPT Vertical Profile Layout Grid

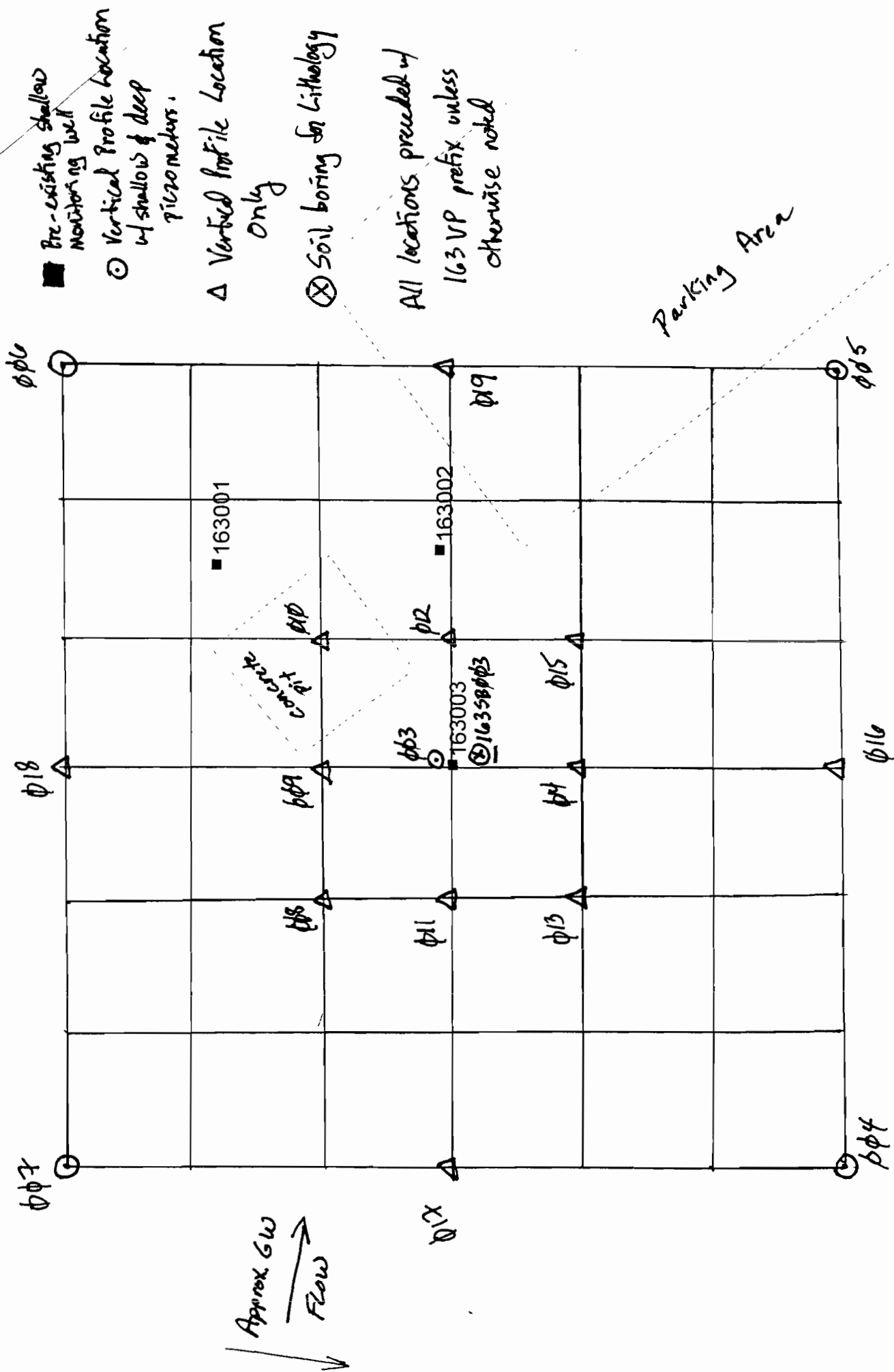


FIG. 4 Area 2 DPT Vertical Profiling Locations





ENSAFE INC.

ENVIRONMENTAL AND MANAGEMENT CONSULTANTS

935 Houston Northcutt Blvd., Suite 113 • Mt. Pleasant, SC 29464 • Telephone 843-884-0029 • Facsimile 843-856-0107 • www.ensafe.com

August 27, 1999

Mr. Paul Bergstrand
Bureau of Solid and Hazardous Waste
South Carolina Department of Health and Environmental Control
8901 Farrow Road
Columbia, South Carolina 29203

**Re: Strategy for Vertical Profiling of VOCs at SWMU 166, Charleston Naval Annex,
Charleston, South Carolina**

Dear Mr. Bergstrand:

As per your request during our August 26th phone conversation, EnSafe is submitting a tentative strategy for vertical profiling of groundwater VOCs at SWMU 163 at the Charleston Naval Annex. Depicted in Figure 3 of the SCDHEC temporary monitoring well permit request submitted to you on August 17, 1999, is an initial inner and outer grid for vertical profiling. The inner 10 ft X 10 ft grid of nine vertical profiles surrounds the shallow monitoring well (163003) with the highest dissolved chlorinated solvent concentrations and lies in close proximity to the 10 ft X 10 ft X 2 ft concrete pit that served as a less than 90 day satellite accumulation area. The outer grid of eight vertical profiles spaced 30 ft X 30 ft apart will lie approximately 20 feet from the inner grid and will delineate the extent of any potential lateral migration of chlorinated solvents.


Since a mobile laboratory will be on-site to provide analytical results within 24 hours of sampling, EnSafe intends to bore additional vertical profiles or re-orient the initial grids should the analytical data and groundwater flow data warrant. A hypothetical example is shown in Figure 1 (attached). If the most southeastern profile point (ID of 163VP005) is contaminated, then an additional profile will be bored approximately 40 feet downgradient, which is twice the distance between the inner and outer grids. If this profile also reveals contamination, the distance will be doubled again and another profile will be bored 80 feet downgradient. This procedure will be used until low concentrations or non-detects are encountered. If necessary, the distance between a contaminated and non-detect profile will be halved and an additional vertical profile advanced in an attempt to determine the leading edge of contamination. Should several outer grid points reveal contamination, more than one additional downgradient profile will be bored at the 40 foot distance. However, in this scenario, additional sampling will focus on delineating the extent of contamination away from the profile with the highest solvent concentrations.

Mr. Paul Bergstrand
August 27, 1999
Page 2

It is believed that the vertical profile data will allow EnSafe to create views of the potential solvent plume in vertical slices much like a geologic cross section. This data will be used to plan any additional fieldwork such as installing permanent monitoring wells at the site with discrete sampling intervals.

Should you have any questions or concerns regarding this strategy, please feel free to contact me at 843.884.0029 or by email, tkafka@ensafe.com.

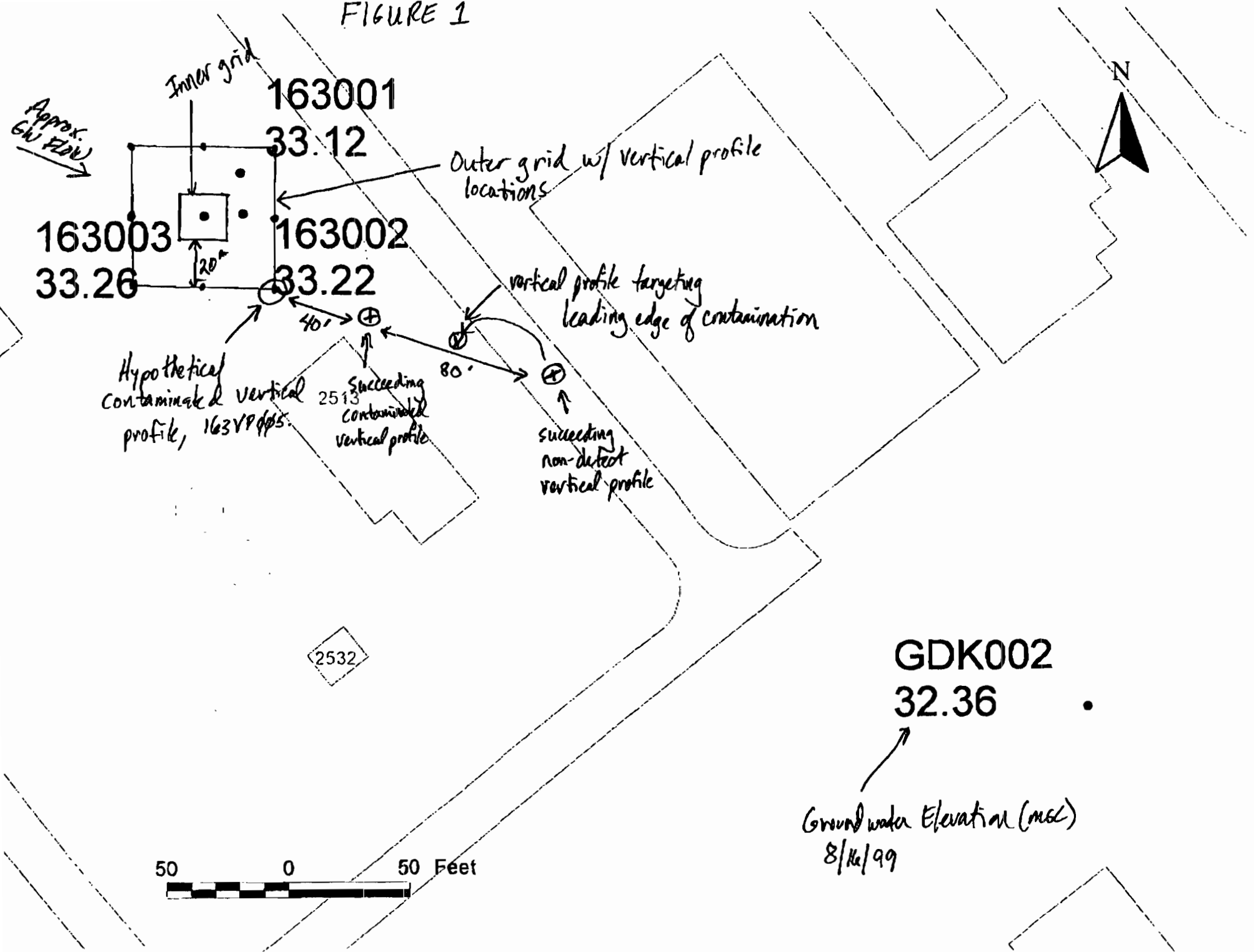
Sincerely,
EnSafe Inc.


By: Todd K. Kafka
Hydrogeologist

Attachment

cc: Tony Hunt, SOUTH DIV, w/attachment
Project File, 2911-08014

FIGURE 1





2600 Bull Street
Columbia, SC 29201-1708
September 1, 1999

Billy WOD
Henry HNS 9/8
File

Henry Shepard II, P.E.
Caretaker Site Office
NAVFACENGCOM, Southern Division
P. O. Box 190010
North Charleston, SC 29419-9010

Re: Interim Measure Work Plan for AOC 633 (PCB Contaminated Soil Removal), Located in Zone G Charleston Naval Complex, Dated June 22, 1999, faxed pages received from Virginia Thomas on August 31, 1999 at 15:27.

Dear Mr. Shepard:

The South Carolina Department of Health and Environmental Control (Department) has reviewed the above referenced Interim Measures Work Plan (8/31/99) according to applicable State and Federal Regulations, and the Charleston Naval Complex Hazardous Waste Permit, effective September 17, 1999. Based on this review the referenced work plan is approved for field implementation.

Further, the Navy should note that the Section 5.0 of the work plan that outlines the contents of the Interim Measure Report should be consistent with the Charleston Naval Complex Hazardous Waste Permit, effective September 17, 1999.

Should you have any questions, please contact Mihir Mehta at (803) 896-4088 or Paul Bergstrand at (803) 896-4016.

Sincerely,

David M. Scaturo, P.E., P.G., Manager
Corrective Action Engineering Section
Bureau of Land & Waste Management


cc: Rick Richter, Trident EQC
Tony Hunt, SOUTHDIV
Dann Spariosu, EPA Region IV
Susan Peterson, Corrective Action Engineering
Michael Danielson, Hydrogeology
Paul Bergstrand, Hydrogeology



2600 Bull Street
Columbia, SC 29201-1708

27 September 1999

HENRY
BILLY
JOHN
FILE

HNS 9/30
1/1/00


CERTIFIED MAIL

Mr. H.N. Shepard II, P.E.
Caretakers Site Office
1690 Turnbull Avenue, Building NH-51
Charleston Naval Base
Charleston, SC 29405

RE: Naval Base Charleston (CNAV)
Charleston, South Carolina
SC0-170-022-560

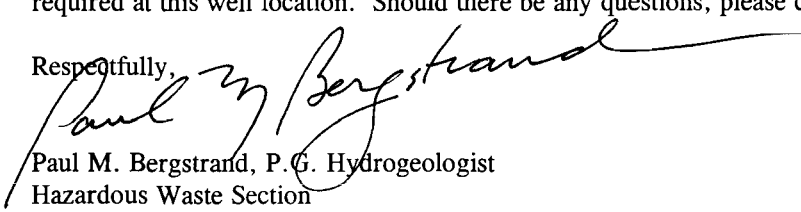
Monitoring Well Request for Zone A, SWMU 39
Revision 0, Dated 22 September 1999

Dear Mr. Shepard:

The above referenced request has been reviewed with respect to R.61-79.265 Subpart F of the South Carolina Hazardous Waste Management Regulations and R.61-71 of the South Carolina Well Standards and Regulations. This request is for the installation of one multi-level monitoring wells to assess parameters of the surficial aquifer. The monitoring well is anticipated to be completed to a maximum depth of approximately fifty feet.

Please note, the actual well installation details are as provided in the monitoring well request. A copy of the monitor well approval and this letter should be on site during drilling operations. The well installation procedures must follow R.61-71 of the South Carolina Well Standards and Regulations. Additional assessment may be required at this well location. Should there be any questions, please contact me at (803) 896-4016.

Respectfully,


Paul M. Bergstrand, P.G. Hydrogeologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Land and Waste Management

Enclosures
PMB/pmb
HW-99-080

CC: Christine Sanford-Coker, Trident District EQC
Paul Bristol, BOW
Mihir Mehta, Hazardous Waste Permitting Section
Tony Hunt, Southern Division, Charleston
Todd Haverkost, EnSafe, Mount Pleasant, SC 29464

DD990758.MWA



2600 Bull Street
Columbia, SC 29201-1708

Monitoring Well Installation Approval

Approval is hereby granted to: Mr. Shepard of Naval Base Charleston for

Zone A, SWMU 39, Naval Base Charleston, Charleston County

for the construction of monitoring wells designated in accordance with the construction plans and specifications submitted to the Department on 23 September 1999 (Kafka to Bergstrand). The well will be constructed within the surficial aquifer to a maximum depth of approximate fifty feet below the surface and screened for the purpose of monitoring aquifer conditions.

Conditions:

1. A driller certified to operate in the State of South Carolina must install the well.
2. That the latitude and longitude, surveyed elevations, boring and/or geologist logs, and actual (as built) construction details for the monitoring well be submitted to the Department within 30 days after installation of the last well.
3. All monitoring wells must be properly developed until clear, sediment-free water samples are obtained. Specific Conductance, temperature, turbidity, and pH measurements should be taken during development. A log recording the values of these parameters should be maintained during development of the well. This log should be submitted along with the "as-built" construction details required by Condition 2 above.
4. All well construction and sampling derived wastes, including but not limited to, drill cuttings and fluids, development and purge water, must be managed properly and in accordance with all applicable state and federal requirements. If containerized, each vessel shall be clearly labeled with regard to contents, source, and date of activity.
5. That the well be labeled with an identification plate constructed of a durable material affixed to the casing or surface pad where it is readily visible. The plate shall provide monitoring well identification number, date of construction, static water level, and driller name and state certification number.
6. Field equipment, including sampling probes, must be decontaminated by steam cleaning or other suitable methods before use and between sampling locations. Well screens and casing must be decontaminated before installation.
7. That notice be given to Christine Sanford-Coker, Charleston District EOC Hydrogeologist, during normal business hours at (803) 740-1590 a minimum of 48 hours before the initiation of drilling activities.

This approval is pursuant to the provisions of Section 44-55-40 of the 1976 South Carolina Code of Laws and the Department of Health and Environmental Control Well Standards and Regulations, R.61-71.

Date of Issue: 27 September 1999

Approval Number: HW-99-080

Paul M. Bergstrand, P.G. Hydrologist
Hazardous Waste Section
Division of Hydrogeology
Bureau of Land and Waste Management

DD990758.MWA



ENSAFE INC

ENVIRONMENTAL AND MANAGEMENT CONSULTANTS

935 Houston Northcutt Blvd., Suite 113 • Mt. Pleasant, SC 29464 • Telephone 843-884-0029 • Facsimile 843-856-0107 • www.ensafe.com

September 22, 1999

HW-99-080
DD 990758.PMB

RECEIVED

SEP 23 1999

HYDROGEOLOGY

Mr. Paul Bergstrand
Bureau of Solid and Hazardous Waste
South Carolina Department of Health and Environmental Control
8901 Farrow Road
Columbia, South Carolina 29203

TRACKED AS MWAF
Complete
27 Sept 99
PMB

Re: Request for Permanent Monitoring Well Permit
Charleston Naval Complex, Zone A, SWMU 39 (CMS)

Dear Mr. Bergstrand:

EnSafe is requesting the installation of a multi-level monitoring well at SWMU 39 in Zone A at CNC. The location of this multi-level monitoring well will coincide with boring 039GP038, a vertically profiled borehole drilled in August 1999 (permit approval HW-99-053), shown in the attached figure. The results of the vertical profile at 039GP038 indicated the presence of several dissolved chlorinated solvent compounds at various intervals between 20 and 48 feet below ground surface. A multi-level monitoring well would provide a permanent means of monitoring the vertical distribution of dissolved chlorinated solvents over time.

The multi-level monitoring well will be installed in accordance with South Carolina Well Standards and Regulations R. 61-71 and will follow the general strategy presented for monitoring well construction and installation in Section 5.0 of Revision 02 of the *Final Comprehensive Sampling and Analysis Plan*. However, it is important to note that the methodology and technology employed for multi-level monitoring well construction and installation is more recent than the above referenced document, and thus, will deviate slightly as follows. The multi-level monitoring well will be installed inside 3-inch diameter casing pushed to depth with a direct push technology (DPT) rig. The well is constructed of 1.7-inch OD polyethylene tubing that has seven discrete chambers or sections to monitor seven discrete depths. To create the monitoring interval for each of the seven chambers, holes are drilled into each chamber at a specific depth and is covered with a stainless steel screen before the tubing is lowered into the casing. Each monitoring interval is anticipated to be less than six inches in length and will be enclosed within a sleeve containing appropriately sized filter pack material. Each monitoring interval will be separated with sleeves containing bentonite pellets to limit vertical cross contamination. The well will be completed aboveground.

The multi-level monitoring well will be designated 03924x where x will be the letters A, B, C, E, F, G, or H (D is omitted to avoid confusion with SWMU 39 deep wells) for each of the seven sampling depths. The letter H will represent the deepest monitoring interval.

For instance, if the depths chosen are 10, 15, 20, 25, 20, 35, and 40 feet bgs, the 20 foot well will be named 03924C and the 35 foot well will be named 03924G.

The multi-level monitoring well is proprietary technology owned by a DPT contractor that will be on-site for a separate vertical profiling investigation at Zone K (Charleston Naval Annex) (permit approval number HW-99-074) beginning September 22, 1999. EnSafe intends to install the well in Zone A upon completion of the Zone K work, which is currently anticipated to be the end of the week of October 4, 1999, contingent upon permit approval.

Please feel free to contact me at our Mt. Pleasant office (843.884.0029) or by leaving a message for at our CNC field trailer (843.747.0336) if you have any questions or concerns regarding this monitoring well permit request.

Sincerely,
EnSafe, Inc.

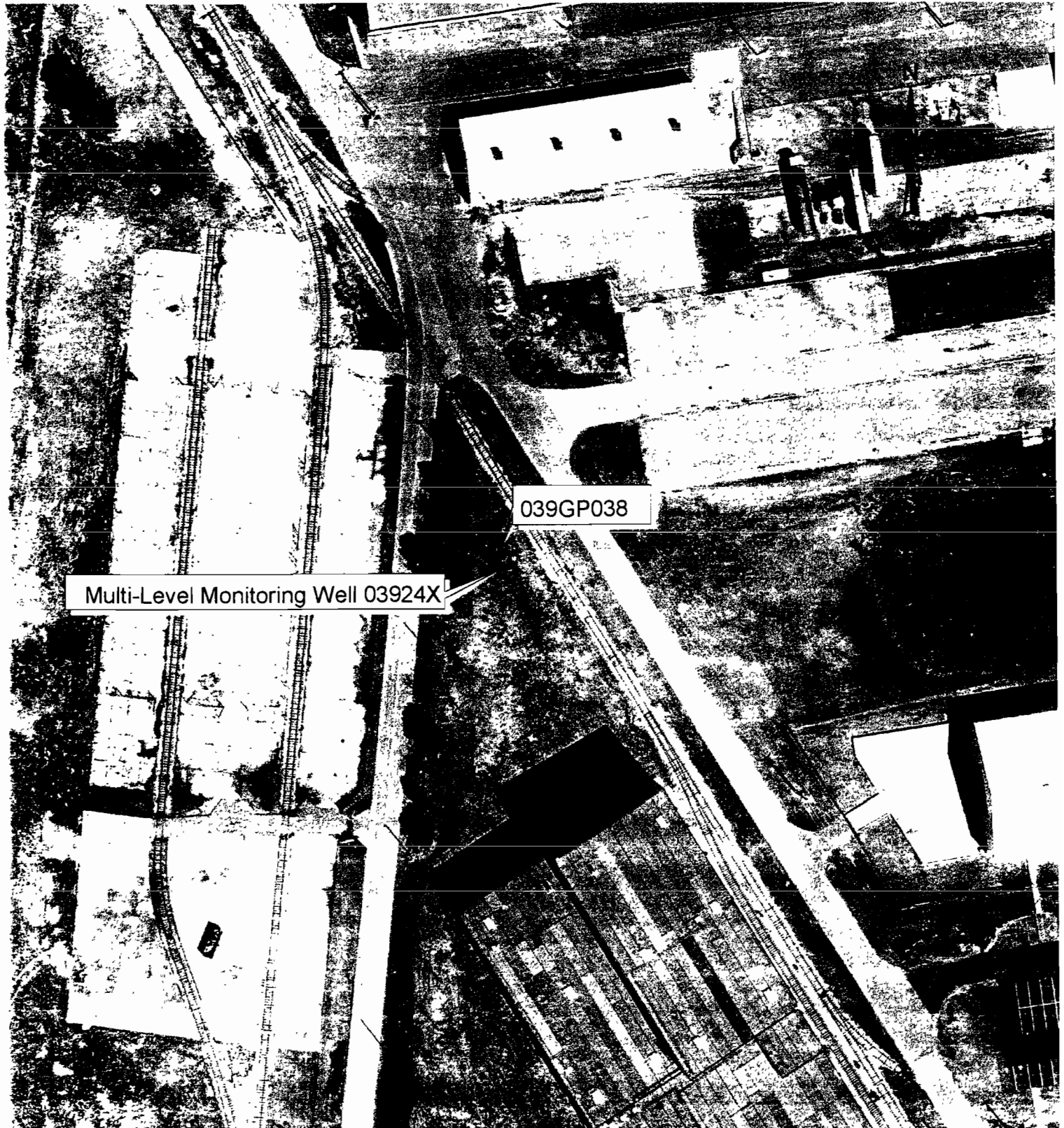
Todd K. Kafka for

By: Todd K. Kafka
Hydrogeologist

Attachment

cc: M. A. Hunt, SOUTHDIV w/ attachment
Dann Sapriosu, USEPA w/ attachment
Ted Blahnik, Dallas w/ attachment
Project File, 2901-08014

PROPOSED MULTI-LEVEL MONITORING WELL SWMU 39, ZONE A, CNC



100 0 100 200 Feet